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ABSTRACT

The National Institute of Education is in the process of designing and conducting a study of compensatory education in accordance with the Education Amendments of 1974. Special attention will be devoted to examining the relative effectiveness of "standardized" versus "individualized" instructional programs. The stated purpose of this report is: (1) to develop a conceptual framework within which a meaningful comparison of individualized versus standardized instruction can be made; (2) to identify specific variables which need to be assessed; and (3) to develop and describe specific procedures which should be used in gathering, analyzing, and reporting the results of the research effort. It is proposed that, rather than attempting to sample schools with uniformly "individualized" or "standardized" programs, the sampling procedure should involve a deliberate and systematic attempt to sample programs which vary as widely as possible on different dimensions of individualization. The primary sampling unit should be classrooms. The central concern of the research should be the accurate description of what is being implemented rather than how well, and a careful evaluation of how those processes affect student outcomes. The analysis and interpretation of the study should be directed toward providing guidelines and recommendations for policy information, and therefore should focus on program variables (and not merely the programs). (Author/JM)

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A STUDY OF THE EFFECTIVENESS OF INDIVIDUALIZED INSTRUCTION IN THE TEACHING OF READING AND MATHEMATICS

Final Report: THE STUDY DESIGN

Prepared For:
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Washington, D.C.

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I. INTRODUCTION

A. BACKGROUND

The National Institute of Education is in the process of designing and conducting a study of compensatory education in accordance with the Education Amendments of 1974. One of the major goals of the research is to analyze the effectiveness of different ways of meeting children's educational needs. As part of this larger NIE effort, special attention will be devoted to examining the relative effectiveness of "standardized" versus "individualized" instructional programs.

"Individualized" programs, which attempt to tailor instruction to the individual student needs, have received increasing attention in the educational community, and Congress has specifically mandated their inclusion in the overall assessment of the effectiveness of different instructional methods used in compensatory programs.

The results of NIE's study will be used to provide Congress with specific recommendations regarding educational programs and objectives, and could form a basis for new legislation. While the focus of the present effort is on compensatory educational programs, it is expected that the results will be applicable to a wide range of educational policy questions. The primary purpose of the particular research effort that is to be guided by this report is to provide a basis for forming policy as opposed to merely evaluating the effectiveness of existing programs. The research is not intended to serve as a vehicle for making funding decisions about individual programs, but rather is intended to have a broader impact on legislative and program decisions regarding compensatory education in general.

This research effort is to be primarily an intensive study of the effects of individualized instruction per se, and other variables are of only secondary interest. It is to be an in-depth assessment of the actual operation of a small sample of existing programs, rather than a broad survey representative of compensatory programs as a whole. And finally, it is designed to include measures based on actual observation of the instructional process in the classroom and its impact on children.

B. PURPOSE OF THIS REPORT

In line with the goals described above, the purpose of this report is (1) to develop a conceptual framework within which a meaningful comparison of individualized vs. standardized instruction can be made; (2) to identify specific variables which need to be assessed; and (3) to develop and describe specific procedures which should be used in gathering, analyzing and reporting the results of the research effort. In approaching each of these tasks, CRI has attempted to describe the practical or theoretical rationale underlying the selection of one approach over another. CRI believes that this is especially important since in many instances the choice of approach is far from obvious, and must rest ultimately on decisions regarding research objectives and priorities. Thus, adequate documentation of the major considerations and assumptions underlying the choice of given research strategy is essential.

C. MAJOR CONSIDERATION AND ASSUMPTIONS AFFECTING THE STUDY DESIGN

CRI took two major factors into consideration when designing the study - the Request for Proposal (RFP) specifications and the "State of the Art" as reported in the literature related to individualized instruction.

The approach described in the RFP suggests that the contractor begin by defining as precisely as possible two distinct categories into which instructional programs could be classified, i.e. individualized or standardized. The aim of this approach would be to compare the outcomes for these two treatments, adjusting for all other sources of variation which can be measured. These sources would include process variables not incorporated within the definition of treatments, contextual and input variables characterizing classrooms, schools, and communities being studied.

Unfortunately, such a comparison would answer the question of which type of treatment is more effective only when operating under

rather restrictive and unrealistic assumptions. First, it must be assumed that there exists a single treatment dimension corresponding to the concept of individualization along which programs can be ranged. Certainly the literature does not reflect a consensus on what such an essential characterization of individualization might be. Programs can be assessed in terms of a number of variables generally agreed to reflect individualization (e.g., variation in rate of progress through a particular set of tasks, or differential assignment of materials), but it is not clear whether a single treatment dimension can be meaningfully defined.

Second, for the approach suggested in the RFP to be appropriate, it must be assumed that the treatments being compared are well-defined entitites which could in principle be replicated in various classrooms. That is, whatever "individualized instruction" is defined as, it must be something which is meaningful to talk about in general. The notion is that this "something" can be added to a pre-existing situation.

Again unfortunately, the literature suggests that this may not be the case either. There is often as much variation between classrooms supposedly using the same program as there is between programs. This may be due to differences in the way a given program is implemented. Or it may be that there are strong interactions between teaching style and curricular approach on the one hand, and various contextual and background variables on the other. For example, it may be that a certain teaching method is never successful in certain settings because of fundamental incompatibilities between the method and these settings.

In light of these problems we are faced with a difficult choice. One alternative is to ignore these potential complexities in the hope that they will wash out or can be suitably handled in the analysis. This approach would lead us to consider this study in terms of a traditional pre-post, treatment versus control group design (without randomization). The overall estimate of the treatment effect would be based on

a comparison of the outcomes for those programs designated "standardized" with the outcomes for those designated "individualized." Statistical adjustments would be used to control for biases related to measured input and contextual variables, as well as for pre-test differences. An overall estimate of program effect for individualized and standardized programs would be calculated and presented along with several caveats.

On the other extreme, we can become overwhelmed by the complexities and abandon all efforts to provide some definitive statement about the effectiveness of individualized instruction. The research effort would then risk losing an immediate policy payoff. Such a study would be primarily descriptive and would make no serious attempt at causal inference.

Neither of these extremes are satisfactory for NIE's purposes. The first is likely to provide a precise answer to the wrong question, while the second begs the question altogether. In addition, neither approach seems to provide enough answers to other questions which interest other Federal, State, and local school district audiences. These questions are related to: the various ways to individualize or standardize programs; the types of gains produced by the various types of programs; the conditions under which certain gains are produced; and the factors which affect implementation of certain types of programs.

With or without the results of this study, Congress must make difficult decisions with respect to compensatory education in two years. Therefore, the broad aim of this study should be to provide as much information as possible on the degree to which educational outcomes might be improved as a result of various policies promoting alternatives to current practice.

CRI finds that this goal can best be accomplished in three sequential stages of research. The first stage should focus on the problem of identifying different types of programs which currently

exist in an attempt to define "treatments." This would involve selecting a number of variables that might potentially be used to differentiate individualized from standardized instruction and determining empirically how these variables cluster.

The second stage should involve assessing the effects of the above defined "treatments" on student achievement and other important non-cognitive outcomes.

The third stage should concern estimating the impact of a change from one type of curriculum to another for a classroom with specified characteristics. This would specifically take into account any interactions that appear to exist between type of curriculum and contextual and input characteristics of the classroom. This process would provide the basis for policy recommendations.

Thus, the suggested approach could be considered a compromise between the two extremes in that it does not banish the notion that there is or can be such a thing as a single unified approach to individualization, but rather it subjects that notion to empirical testing. If in fact individualized programs do tend to share a set of unique features which can be formed into a single cluster and if any of these clusters do in fact tend to result in better outcomes, then that fact will become apparent from the data analysis in the study.

D. KEY IMPLICATIONS FOR THE STUDY DESIGN

Several critical consequences follow naturally from the approach described above. These will be mentioned briefly here and developed more fully later in the report.

- Rather than attempting to sample schools with uniformly "individualized" or "standardized" programs, the sampling procedure should involve a deliberate and systematic attempt to sample programs which vary as widely as possible on different dimensions of individualization.

- The literature suggests that there is as much variation between classrooms that are supposedly using the same instructional program (e.g., classrooms using Individually Prescribed Instruction, (IPI)), as there is between different instructional programs. Therefore, for purposes of this study, the primary sampling unit should be classrooms rather than programs (such as IPI) which are proported to be utilized.

- The notion of how "well-implemented" (i.e., how closely the implemented program matches the original program design) a particular plan of individualized instruction is, becomes less central to the research than an accurate description of what is being implemented (on the basis of actual observational measures), and a careful evaluation of how those processes affect student outcomes.

- The analysis and interpretation of the study should be directed toward providing guidelines and recommendations for policy-information which go beyond an evaluation of currently available programs; thus it should attempt to provide evidence concerning the effects of the underlying program variables (and not merely the programs) included in the study.

II. PROJECT CONCEPTUALIZATION

In order to develop an adequate design for a study that is directed toward providing policy-relevant information, it is essential to articulate the fundamental goals and assumptions very carefully, i.e., to define the problems and issues which the study must address. The major goal of the study is clearly stated in the RFP -- to study the effects of individualized instruction on compensatory education students. However, before this general goal can be achieved, the criteria for judging effectiveness and definitions of individualized and standardized programs must be developed. It is this latter problem that we shall take up in this chapter.

A. CONCEPT OF INDIVIDUALIZATION

The RFP notes that several "individualized programs" presently in general use differ widely in many respects, but seem to share certain characteristics:

1. Stated performance objectives.
2. Diagnosis of individual student needs with respect to these objectives.
3. Regular progress tests.
4. Use of test findings to identify the optimal instruction rate for each child, allowing each student to proceed at his own rate.

The RFP identifies #4 above as the essential distinguishing feature of individualized instruction.

One of the problems with attempting to isolate "essential distinguishing features" of individualized and standardized instruction is that it is difficult to find features which seem to distinguish the two types taken as a whole and are centrally characteristic of either type by itself. As the RFP notes, none of the four common characteristics of individualized programs, with the exception of #4, is typically uncharacteristic of standardized programs. However, that does not mean that

individualization of instructional rate is the only important difference between the two approaches. Nor does it mean that variations in rate according to individual student needs is the most important goal of individualized programs themselves. For example, Lindvall & Cox (1972) state that Individually Prescribed Instruction (IPI) is organized around six goals, only one of which is that each student proceed at an optimal rate. (The others include active student involvement, self-selection and self-direction, self-evaluation, variation in techniques and materials, and regular progress toward mastery of specified objectives.)

It appears to be easier to distinguish individualized from standardized programs on a broad conceptual level than at the operational level. The differences between individualized and standardized programs appear to be largely in their organizing goals and differential instructional emphasis. That is, individualized programs tend to emphasize certain instructional approaches whereas standardized programs stress others. But there is also wide diversity within the two programs, and no single instructional technique can be singled out as uniquely defining for either type of program. Instead of searching for a single defining feature, it seems more desirable to begin with a conceptual analysis of individualized programs, based both on a distillation of the shared goals and assumptions displayed by existing programs and a systematic development of the concepts underlying them. Out of this analysis a working definition of individualized programs will emerge which will accurately reflect both the real underlying commonalities and the diversity to be found between and within them.

I. Towards Defining Individualized Instruction

For the purposes of this report "individualized" instruction will be differentiated from "standardized" instruction in terms of the extent to which the educational program is oriented towards the particular and unique characteristics of each student within that program or classroom.

a. The Sequential Process of Individualization

Central to CRI's concept of individualization is the notion that an individualized program necessarily involves three interrelated steps. First, a diagnosis of the particular needs of a student must take place. Thus a student's peculiar or special abilities, achievement, interests and/or home background are taken into account. Second, an educational program which is specially tailored to the individual student's presumed optimal learning mode is prescribed. Thirdly, the prescribed treatment or program is implemented.

When all three above steps have been taken in order, we can say that there is "individualized" instruction. It should be made clear, however, that the major distinction between individualized instruction and other types is not merely whether diagnosis, prescription and implementation occur, but when they do occur, whether or not they are focused on the individual student's needs rather than on the group's needs.

In considering this sequence of three steps, it is tempting to include additional criteria for defining individualization/standardization. First, it would be possible to form additional criteria concerning the basis on which the diagnosis is made, or the number and kind of student characteristics taken into account. It is CRI's contention that while it is important to gather this kind of information, it is not relevant to the problem of distinguishing individualized from standardized instruction. There is simply no single set of student characteristics that educators agree should be taken into account in making diagnosis. From the standpoint of defining individualized instruction, the manner of diagnosis is less important than the fact that it was made on the basis of some bona fide set of criteria applied to students as individuals.

It would also be tempting to gather data regarding the assumptions underlying the teacher's selection of a given prescription for a particular diagnosis; that is, on what basis does a teacher decide what educational strategy will best fit a diagnosed need? Again, while this is an interesting question in its own right, it is our feeling that it must be considered tangential to the problem of studying the effects of individualized instruction, and therefore lies beyond the scope of the study.

In summary, our conception of individualized instruction involves a sequential process of diagnosis, prescription and implementation focused on the individual student's needs. The particular basis for the diagnosis will not be considered an important feature in defining individualized instruction, nor will the nature of the formal or informal theory underlying choice of prescription, so long as that individual student prescription is based on the diagnosis.

b. Multidimensional Nature of Individualized Instruction

The three step sequence described in the preceeding section is considered to be the essential "core" of individualized instruction. Concretely, however, there are a number of ways in which the process of individualizing instructional treatments can be carried out. CRI found it useful to distinguish eight derived categories of individualized instructional treatments. These categories were developed on the basis of a review of relevant literature and validated through an initial telephone survey, through which CRI obtained information from teachers about their actual instructional practices.

Individualized instruction can be differentiated by varying (1) the content or objectives different students are expected to master; (2) the rate at which different students are expected to proceed through identical objectives and (3) the sequence in which a given set of objectives are prescribed for different students. In addition, when different students are working on the same objective, individualized instruction can be differentiated by varying (4) the materials that different students utilized, (5) the teacher behavior employed with the different students, (6) the student behavior that is expected from different students, (7) the social setting and (8) physical setting in which learning for different students takes place.

The eight categories clearly interlock to some degree, since the decision to vary instructional strategy in any one category (e.g., materials) often implies variations in other categories as well (e.g., physical setting or student behaviors). The categories represent an attempt to list the different variables involved in instruction covering

what the student is doing, why and where he is doing it, with whom and with what materials, at what rate and in what sequence, and what teacher behaviors are involved. It must be kept in mind, however, that in order for any of the eight above characteristics of instruction to meet the essential criterion of individualized instruction, the differential treatment that is prescribed and implemented for an individual must be based upon a diagnosis of the student's own particular needs.

These variables were selected for study primarily because they reflect operational differences between classrooms, rather than differences in the theoretical conceptions or educational assumptions underlying a particular instructional approach. Classrooms can be meaningfully compared with respect to each of these characteristics, and taken together the categories seem to encompass all the major ways in which instruction can be individualized at an operational level.

An alternative to the approach to the variable categorization taken here would be to construct a similar list of variables which are based on broad programmatic educational goals or different models of the learning process (such as the "extent of student involvement and self-direction" or "amount of consolidation of learning provided"), and attempt to determine which of these appears to be associated with better outcomes. However, it is our position that such an approach would be of little value because it is not associated with specific operational practices. To be of any practical use, the study must be able to associate specific instructional practices with classroom outcomes, and thus we have focused our categorization of variables related to individualization/standardization around actual instructional techniques. Once we have learned something about which practices are associated with which outcomes, we will be in a much better position to examine the implications for educational theory.

Besides characterizing individualized instruction in terms of variation in content, rate, sequence, etc., also central to our concept of individualization is the extent to which instruction is individualized, i.e., the percentage of students who utilize different materials or

receive different teacher behavior etc., as a function of individual diagnostic-based prescriptions. For example, the teacher may form small (theoretically homogeneous) instructional groups which in fact are prescribed different objectives. By our definition this teacher has individualized instruction more than a teacher who prescribes the same objectives for every student in the class. Therefore, individualized instruction can vary in the way it occurs and the extent to which it occurs. Because of these variations, we have concluded that individualized instruction is multi-dimensional in nature as illustrated in Table 1 below.

Table 1

The Multidimensional Nature of Individualized Instruction

Eight Dimensions Of Individualized Instruction	Extent of Individualization/Standardization: Extent to which Diagnosis, Prescription, and Implementation Occurs for: Individual Student – (Individualized)	Subgroups – (Differentiated)	Total Group (Standardized)
1. Content			
2. Rate			
3. Sequence			
4. Materials			
5. Teacher Behavior			
6. Student Behavior			
7. Social Setting			
8. Physical Setting			

The degree to which these eight dimensions of individualized instructions occur independently of one another is an empirical question that should be investigated in the proposed research. Further, the nature of the interrelationship among these dimensions may help define qualitatively different kinds of individualized instructional programs. For example, in some kinds of individualized instructional programs, there may be a high degree of individualization in terms of rate and materials, while in other kinds (such as might be found in alternative schools), greater individualization in content and sequence might be expected.

The eight dimensions of individualized instruction are disccussed in more detail in a later section and are hereafter referred to as the "key" process variables that distinguish individualized and standardized instruction.

2. Towards Defining Standardized Instructions

In contrast to individualized instruction, standardized instruction involves assigning essentially the same educational curriculum to all students in a given group. This assignment may involve a prior step of diagnosis of individual needs, but is distinguished from individualized instruction in that the prescribed curriculum and implemented instructional programs are based on what would be best for the majority of students in a classroom rather than for sub-groups or individuals.

In actual practice, the distinction between individualized and standardized instructional approaches will be largely a matter of the extent to which individualization is occurring along any of the eight dimensions. The greater the number of students in a given classroom who are treated differently because they have been found to have different characteristics and needs, the more the instructional program

can be said to individualized.[1] In a completely standardized program, however, every student is treated alike.

B. CONCEPTUAL MODEL FOR THE STUDY DESIGN

Individualization of instruction does not occur in a vacuum. Both the form that individualized or standardized instruction take within a classroom and the impact on outcomes are likely to be affected by a wide range of other variables.

In addition to the key distinguishing process variables, other variables have been included because they meet one or more of the following criteria:

- variables that are likely to have a direct impact on outcome measures in any program whether individualized or standardized.
- variables that potentially affect the way in which individualized or standardized programs are implemented.
- variables that are likely to moderate the effectiveness of various types of individualized or standardized programs.

In the following sections, using four sets of variables to organize the discussion, we will present our conceptual scheme by identifying the component variables, pointing toward their operational definition, and justifying their inclusion in the scheme.

The first set are process variables which pertain to "in-class" phenomena. This includes all those variables describing the way in which instruction is actually carried out.

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[1] It should be noted that it is least logically possible that individual diagnosis might lead to the conclustion that all students in a given classroom have the same needs, in which case a standardized program might be indicated even by "individualized" criteria. While it is obvious that some classrooms are more heterogenous than others. It is CRI's position tnat in practice no classroom is homogeneous.

Two categories of process variables need to be distinguished for purposes of this research. The first kind consists of the factors which differentiate individualized from standardized instruction. These are of central interest to the study and have been outlined previously. The second category includes all classroom process variables that do not themselves distinguish between these two types of instruction, but which are important aspects of the instructional process in other ways and which therefore need to be assessed. These would include, for example, the number of hours per week devoted to math and reading instruction, the use of different kinds of positive and negative reinforcements techniques, and the type of instructional materials available for use and actually used in the classroom.

Two other sets of variables share the property of being "givens." They are contextual variables thought of as constraints imposed by either extra-class, school, or community characteristics, and input variables, which are primarily individual student or teacher attributes.

More specifically, contextual variables refer to those characteristics or dimensions which can be used to describe the instructional setting at a level broader than the individual classroom. Major contextual variables include geographical region, urban-rural characteristics, community characteristics of students and staff in the school as a whole. More interesting contextual variables might include such things as the interpersonal climate in the school, level of parent involvement, the nature of informal lines of communication, and the degree of district, school and teacher control over program selection.

Input variables refer to those characteristic features of the classroom itself which might be expected to relate to the success or failure of the program, and which should be included in the analyses as covariation factors. The major input variables include the characteristics of the students in the class (e.g. class size, initial achievement scores, mixture of disadvantaged vs. non-disadvantaged students, initial non-cognitive scores, etc.); those of the teachers and other instructional staff (e.g. staff size, teaching experience, instructional

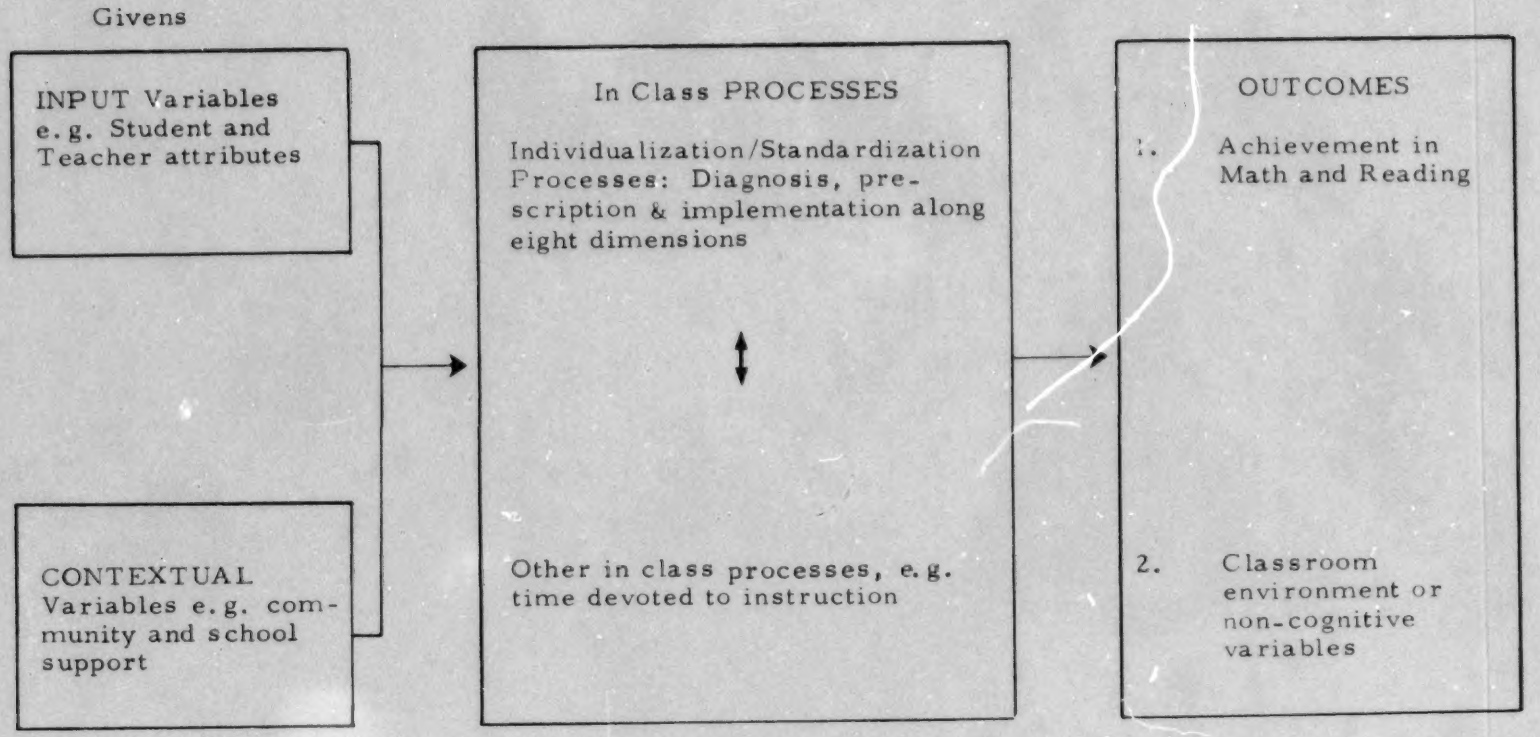


EXHIBIT II-1: Conceptual Model Schema

assignments and roles, presence of specialized skills, initial attitudes); and the characteristics of the classroom program and facilities (e.g. instructional grouping patterns, traditional vs. open or non-graded classroom, physical facilities).

The fourth set of variables in the conceptual model are outcome variables. The most obvious outcome variables the research team should look at are student's achievement in mathematics and reading. Less obvious, but possibly of equal significance are classroom environment or non-cognitive dependent variables. Programs will certainly have consequences on student and teacher attitudes as well as direct academic consequences. Programs which effect how students and teachers feel about themselves, each other and the learning process could even be more important than initial specific content learnings. For example, if a student as a result of being able to achieve at his own rate, learns to like learning, that might be more valuable in the long run than how well he initially learns to read.

Exhibit II-1 presents an abbreviated visual sketch of the proposed conceptual model indicating the interaction between these four sets of variables. As Exhibit II-1 illustrates, input and context variables are expected to have direct effects on in-class process variables which in turn effect outcome variables. In addition, process variables will have effects on each other. Finally, although it is beyond the scope of the specific proposed research, outcomes will (hopefully) in turn have effects on input, context and process variables.

The primary concern of this research is the effect of individualized versus standardized compensatory instruction on outcomes, i.e., achievement in math, reading and other non-cognitive factors or classroom environment. In order to make intelligent statements about this primary concern, the research effort should specify under what set of circumstances individualization-outcome relationship occur. Probably, individualization is likely to be more successful in certain contexts or communities and less successful in others. Likewise, inputs, i.e., student and teacher attitudes, prior experiences, abilities and interests,

will also have major effects on the nature of individualization and resultant outcomes.

In summary, CRI's overall conceptual approach to the study design differs in a number of respects from that suggested by NIE in the Request for Proposal. The reason for these differences is that after considering the nature of the problem, we do not feel that individualized instruction can be assumed to differ from standardized instruction in any single, well-defined respect. The two approaches at the conceptual level seem to represent two reasonably distinct instructional strategies, but ones which are characterized at the operational level by highly complex clusters of interrelated practices, the particular combination of which vary widely from one program to another. Thus it is considerably easier to distinguish the two approaches at a broad conceptual level rather than at the operational level in the classroom. The methodological approach that we have developed will, however, allow the contractor to develop empirically derived operational definitions of individualized programs.

III. METHODOLOGY

A. INTRODUCTION

The purpose of this chapter is to specify in some detail the procedures to be used in carrying out the study design. The following methodological issues will be considered: the research design and the research questions that the study should address; the nature of the sample and procedures for obtaining it; operationalization and measurement of all study variables; and the development of specific plans for data collection and data analysis.

Since the choices and recommendations CRI has made with respect to each of these methodological issues are based on our analysis of the best overall strategy to take in designing the study, we shall attempt wherever appropriate to document the criteria that have been used in making a particular decision. While this will be done specifically in each of the sections that follow, it may be useful to begin with a brief discussion and review of the considerations involved in developing the overall design.

The major criterion in developing the methodology is that the initial stages of the research be consistent with the definition of individualization/standardization as a multi-dimensional concept. Later stages of the research, however, should be directed at determining on an empirical basis whether it makes sense to talk about individualization as a single treatment dimension; and if not, what naturally occurring treatments related to individualization can be identified? The next step of the research strategy would be to examine the effects of these treatments on outcome variables.

The "program free" orientation CRI has taken in designing the study has several implications for the types of measures, procedures, and analyses that will be used. For example, the instrument employed

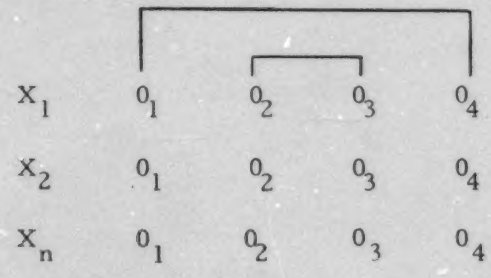
to assess student achievement can be focused on general educational goals rather than on the particular objectives of the various programs being compared, i.e., this approach avoids to some extent the problems that are inherent in trying to make comparisons between programs which may have somewhat different objectives.

Another implication is that the classroom rather than the school or "educational program" should become the sampling unit. Thus, each unit can be described in terms of the degree to which it does or does not exhibit "individualization" of instruction. By taking this approach, the focus of attention is on those underlying variables that truly distinguish individualized from standardized instruction rather than on idiosyncratic program characteristics that are tied to given sets of instructional materials which are likely to be changed by the time the study is completed.

Our basic approach then is to obtain a sample of classrooms that appear to vary greatly along the eight dimensions of individualization/standardization, measure through a series of instruments the extent to which the classrooms actually do vary, and then contrast the outcomes of programs which appear to cluster around certain underlying process, input and contextual variables.

B. RESEARCH DESIGN

The study involves a quasi-experimental, longitudinal design, with pre and post measures of student achievement and teacher and student attitudes. Treatment groups are defined by categorizing existing classroom programs into two or more groups on the basis of their patterns of individualization or standardization of classroom instruction on each of several dimensions. In addition, the design provides for two observations of classroom processes, separated by a period of two months. The design can be schematized as follows:



X_1 through X_n refer to different treatment groups: O_1 and O_4 are observations of student achievement and non-cognitive, attitudinal measures, and O_2 and O_3 are observations of classroom processes.

The primary focus of the study is on determining whether the treatments (i.e., differences in individualization of instruction) have any differential effect on outcome measures (i.e., changes from O_1 to O_4 in student achievement and other measures).

The variables in the study have been divided into the following categories: dimensions of individualization, other process variables, outcomes variables, input variables and contextual variables. Input, contextual and other process variables have been included for two reasons. The first is to "control" for possible confounding of the variable of primary interest with other variables. If, for example, it happens that classrooms with individualized instruction tend to have a greater number of teaching aides than do classrooms with standardized instruction, it is necessary to take this into account in comparing the two types of programs. Second, it is important to be able to assess the extent to which the effects of individualization might interact with other contextual or background variables. Standardized instruction may be more effective in some settings, individualized in others. Since the results are to be used to help make important policy recommendations, it is essential that the analysis enable us to make statements about the likely effects of a given program not only in the abstract, but in the particular types of settings in which it might be implemented.

C. RESEARCH QUESTIONS

The overall research strategy can be divided into three stages, each of which can be described by a set of research questions.

1. Stage 1 - Defining Treatments

In the first stage, the study should focus on describing the types of compensatory education programs which currently exist in terms of input, context and process variables. The following research questions should be addressed:

- What patterns of variation exist between programs with respect to variables related to the concept of individualization?
- Is it possible to define a single meaningful dimension corresponding to the notion of individualization?
- Is it possible to define a typology of programs with a few categories into which most existing programs can be classified?

2. Stage 2 - Comparing Treatment Effects

Data from the first phase would be used to divide programs into categories, on the basis of naturally occurring clusters of program types. In the second stage, the task would be to assess the effects of the treatments defined in the first stage on student achievement and classroom environment measures. This would include addressing the following research questions:

- Which program types seem to produce the largest gains or growth rates in student achievement?
- Which types of programs produce the largest "gains" or positive changes in attitudes and self-concept?
- Are these effects present even when the effects of possible confounding variables are taken into account?

3. Stage 3 - Predicting Implementation Effects

In the third stage, we would attempt to predict the likely effects of the program "treatments" if they were implemented in classrooms having specified characteristics. The goal would be to develop a model of the likely impact of changing from one type of curriculum to another. If the treatments have consistent effects across classrooms, this task is a rather straightforward extension of stage 2. However, it would go beyond stage 2 in that interaction effects would be taken into account as well. Specific research questions include the following:

- Do the different "treatments" or program types actually occur in a wide variety of settings? If there is a particular type of setting (as defined by contextual and input variables) in which a given program type does not occur, is this because of any fundamental incompatibility between the two? (The first is an important empirical question, the second an important analytic one).
- Are there contextual and/or input variables that serve to limit or to enhance the effects of a given program? Are there "cross-over" interactions such that a program which is superior in one setting is inferior in another?
- For a given set of contextual or input characteristics, what is the likely impact of a particular type of program when implemented in a classroom having those characteristics?

Each of the above sets of research questions can in turn be concretized into a large number of more specific questions, by framing it in terms of specific variables rather than categories of variables. In the sections which follow, we shall attempt to outline in more detail the procedures developed to carry out the research design and answer the general research questions set forth above.

D. SAMPLING PLAN

In developing a sampling plan, we have been guided by (1) a set of general considerations which reflect the goals of the overall study design and (2) specific constraints imposed by other features in the design and secondary policy goals stated by NIE in the Request for Proposal.

1. General Considerations

For the reasons stated in Chapter I, CRI does not deem it advisable to seek a sample of programs which are categorized as individualized or standardized on the basis of only one arbitrarily chosen criterion (such as the presence or absence of variation in rate of student progress). Rather, the goal should be to identify a sample of programs which represent a wide range of variation along each of several different dimensions of individualization vs. standardization.

Practically, this would involve a sequence of steps. First, a sample of districts would be selected on the basis of existing survey data. The second step would involve selection of schools within each district that appear to represent a reasonable degree of variation in their overall degree of individualization or standardization. The third step would involve gathering more specific information by telephone on the classrooms and programs within these schools, and the fourth step would involve using this information to select a final sample of classrooms.

Since it is not the purpose of the study to obtain an accurate estimate of the frequency with which different types of programs are actually being used, this should not be a major consideration in selecting the final sample. Certain types of programs (e.g., standardized programs) may well be underrepresented in the final sample with respect to their actual frequency of occurrence, and others may be overrepresented. The goal should be to accurately reflect the range of variation, rather than the frequency of program types.

2. Additional Constraints Set by Policy

Three additional constraints on the sample are imposed by secondary policy considerations set forth by NIE in the Request for Proposal.

a. Compatibility with District Survey I

NIE would like to cross-validate program description obtained in District Survey I with measures of actual implementation obtained in this study. Therefore, one of the sampling constraints is that half of the total sample should be obtained from District Survey I. CRI suggests that the other half of the sample should be obtained from the sampling frame developed for District Survey I, following the same stratification criteria. Thus, in the first of the four steps outlined above, the contractor would begin with the 102 districts represented in District Survey I and add 102 districts selected according to the same criteria as used for District Survey I, for a total of 204 districts. In each of the remaining steps toward selecting a final sample, the contractor would impose the constraint that half of the schools, and later half of the programs selected, would be represented in District Survey I.

b. Instructional Setting

One of the major issues surrounding the use of compensatory education funds is whether compensatory education programs should be implemented within a regular classroom or outside of it. At present, many schools provide separate instruction for students in compensatory programs. By providing separate instruction, there is some insurance that the funds are benefiting the students for whom they are intended rather than being used to improve instruction in general; however, there are questions about whether it is always wise to pull disadvantaged students out of a regular classroom for special instruction.

In order to gather data relevant to this policy question, NIE would like to include in the sample schools of both types, in sufficient numbers to make a meaningful comparison.

To meet this secondary policy objective, an additional constraint needs to be imposed on the sample. Approximately 50% of the schools included in the sample should provide compensatory programs outside of the regular classroom, and approximately 50% within it. However, whenever reading and/or math instruction is provided both inside and outside the classroom, the "outside the classroom" setting should be considered an extension of the regular classroom. Therefore, these instances should be treated as a part of the "non-pull out" sample. CRI recommends that data relevant to this criterion should be gathered in the telephone screening procedure. Every attempt should be made to ensure that in the sample as a whole, this "instructional setting" variable is not confounded with the extent or type of individualization provided in the program.

c. Avoidance of "Idiosyncratic" Programs

NIE has stated that it wishes to exclude from the sample those programs which are unique or highly idiosyncratic. Since the long-range purpose of the study is to make recommendations to Congress in the form of objectives which can be implemented on a large scale, the policy reasons for this are obvious.

However, NIE has operationalized this criterion by stating that programs chosen should be represented in at least two districts or 100 classrooms. This operationalization poses some difficulty within our framework, since we have recommended that the study proceed under the assumption that all programs are different until proven similar.

Moreover, it is our belief that the sample should not be restricted to programs which are presently in widespread use. No attempt should be made to eliminate programs which represent, for example, a unique or idiosyncratic use of imagination and insight. The only valid policy reason for eliminating idiosyncratic programs, CRI believes, would be if they are successful by virtue of a set of physical or financial resources not generally available, or by virtue of a set of instructional practices which cannot be implemented elsewhere.

To help ensure that the programs chosen could for the most part be implemented elsewhere CRI recommends that the sample be restricted to public schools. Since there is a good deal of variation even among public schools in the amount of resources available and the political climate surrounding educational practices, this does not completely solve the problem. But it does help to solve it, since it is not unreasonable to maintain that any program which is currently being implemented in a public school can at least to some degree be implemented in others as well.

3. Determination of Sample Size

CRI believes that the study should involve a detailed, in-depth and extended examination of a relatively small set of schools rather than a more superficial examination of a much larger set. We are, therefore, recommending that the study design include extended classroom observation, structured interviews with teachers, and other data collection techniques which are relatively expensive and time consuming.

As a practical manner, then, the sample size has been set with this consideration in mind. We have set a target size of 250 classrooms for a complete set of data.

4. Selection of Grade Level

The policy questions underlying this research are relevant to grades K through 4. However, to sample all five grade levels would present enormous practical difficulties. Indeed, these difficulties do not disappear entirely unless the study is restricted to one grade level, and CRI recommends that this be done. This restriction enormously simplifies the problems of data collection, selection of tests, and interpretation of the results of the study, and allows the contractor to concentrate resources on ensuring the internal assessment of the generalizability of the results across different grade levels. It is our feeling that in a study primarily focused on the processes rather than the content of instruction, this limitation can be lived with.

CRI recommends that the study should focus on Grade 3. This recommendation is based on two considerations. First, our discussions with school personnel and educators suggested that in the grades K and 1, and possibly 2 as well, individualization of instruction whether planned or intentional is so widespread that it is difficult to find classrooms in which instruction can be said to "standardized," at least in terms of actual classroom practice in reading instruction.

Second, it is much more feasible to obtain reliable outcome measures in the later grades. This is particularly true for student self-report attitudes, which are relatively more difficult to measure reliably in early primary grades. But it may also be true of achievement tests, because it is easier to pick up short term gains after students have learned onset skills.

5. Classroom as the Sampling Unit

CRI recommends that the classroom be used as the primary sampling unit. "Classroom" is defined as the setting in which compensatory education students receive their math and reading instruction. Therefore, "program" is defined as the reading and math instructional processes and content utilized within a given classroom. In practice, this means that whether compensatory education students receive their reading and math instruction in a "regular" classroom or in a separate lab setting, that setting should be treated as the sampling unit. However, in instances where compensatory education students receive instruction in both the "regular" classroom and in another setting (e.g., lab), their participation outside of the classroom should be considered an extension of the classroom and not as a separate sampling unit. Data, however, should be collected on the educational experience of compensatory education students in all settings in which they receive reading and math instruction; however, for analysis purposes, the contractor should be able to distinguish the differences in settings.

Data should be collected on all students in the classroom, whether disadvantaged or not. However, the contractor should be able to clearly identify the compensatory education student sub-group in each classroom, and run separate and parallel data analyses on this group. In practice this may frequently pose some difficulties. While in many classrooms the teacher will be able to provide the names of compensatory education students, or they will be identifiable by virtue of the nature of the program, in other classrooms this will not be the case. When it is not possible to identify such students on the basis of information provided by local school personnel, it is recommended that pretest achievement scores be used for this purpose, using a criterion of Q1 or Q2 scores in the total math or total reading scores.

For purposes of data analysis, it will often be possible to examine the data within classrooms as well as between. Thus data files should be kept on individual students.

6. Procedure for Obtaining the Sample

It is recommended that the sampling strategy proceed sequentially from selection of districts to selection of schools to selection of classrooms.

a. Selection of Districts

The goal in the first stage should be to obtain a nationwide sample of districts representing a variety of geographic regions, district populations, socioeconomic levels, and other characteristics. It is not the purpose of this study to offer a truly representative sample of schools or districts. However, it is highly unlikely that a sample restricted to narrow geographic regions will adequately represent other background and contextual factors in sufficient variety. We have found that States differ considerably in the ways in which they encourage or require their districts to utilize Title I funds. Many of these differences may have an important bearing on how the programs are carried out.

In addition, geographic differences in and of themselves are very likely to emerge as important determinants of the impact of the programs. Since the policy recommendations based on the study will be applied on a nationwide scale, it is important to have sufficient information to take these differences into account. For these reasons, we feel that wide geographic diversity in the sample is essential.

Moreover, the contractor should select half of the sample of districts from District Survey I. It is therefore recommended that the contractor use the sampling frame developed for District Survey I to select 102 districts, stratified according to the same variables used in that survey. These 102 districts would be added to the 102 selected for inclusion in District Survey I for a total sampling of 204 districts representing different district sizes, geographic regions, and levels and combinations of Federal and State funding for compensatory education.

b. Selection of Schools

In the second stage, the contractor should send letters to the superintendents of the 204 districts, describing the study and soliciting recommendations of four principals of schools within each district receiving compensatory funds. Two principals should be likely to have an "individualized," and two should be likely to have a "standardized" third grade classroom within their school. These letters should be sent on or about March 1, 1976, and should be followed up by letter or phone if there is no response within two to three weeks.

This procedure would yield a list of approximately 800 schools, with some initial likelihood that both individualized and standardized classrooms might be found in these schools. (It should be emphasized that we do not expect that superintendents will always have accurate information regarding the individualization of classrooms in their schools, and that the purpose of requesting this information is to help locate classrooms, not to categorize them conclusively).

A possible variation of this procedure should also be given consideration. It might be considered desirable to weight the number of schools selected according to the size of the district, with superintendents of large districts being asked to identify a larger number of schools than superintendents of smaller districts. To a large extent, this is a matter of policy, and NIE should provide guidance to the contractor in determining to what extent the sample should be representative of the districts receiving Title I funds, or the schools receiving such funds, or a combination. In making this determination, it should be kept in mind that the District Survey I sample already has overrepresented large districts in proportion to their total number, although probably not in proportion to their share of the total student population.

c. Selection of Classrooms

On March 29, 1976, the Contractor should send letters to the principals identified in the preceding stage, asking them to identify a third grade classroom which might be appropriate for inclusion in the study, and to provide as much preliminary information on the nature of the program as they are able to give.

On the basis of this information, the contractor should narrow the list of schools/programs to 400 which seem to represent a good initial mix of individualized/standardized classrooms within each of the levels of variables which stratify districts.

The contractor should then begin a screen by means of a telephone screening procedure of the 400 teachers identified by principals as responsible for running the classrooms. The telephone screening should focus on the nature of diagnosis, prescription and implementation utilized in the classroom, and its goal should be to provide a basis for preliminary categorization of each program as "individualized" or "standardized" with respect to each of the eight dimensions described earlier (or something very much like them). Additional information should be obtained at this stage on the

"instructional setting" variable, size of the classroom, number and proportion of disadvantaged students, and any other variables which will be considered in determining the final sample.

It is suggested that this screening be conducted between May 3 and June 4, 1976. Upon completion of the teacher screening, the contractor should have enough data to construct a matrix consisting of a list of schools contacted, crossed with individualization/standardization variables. The next step would involve using the information contained in this matrix to select a final sample of 250 classrooms. The contractor should make use of systematic data analysis to aid in selection of the final sample; for example, use of such techniques as multidimensional scaling to help identify naturally occurring clusters of program types from which classrooms can be selected. Such techniques will also help to document the procedure used in selection. This task should be completed by June 25, 1976.

The criterion for selection would be to represent a broad range of types of programs. Some programs would undoubtedly be "individualized" with respect to all the variables; others would be "standardized" with respect to all of them. We suspect, however, that a substantial number would represent a mixture of individualization on some variables and standardization on others. These latter should be included in the final sample in sufficient numbers to accurately reflect the range of variation found in the initial sample. There should be an attempt to include programs representing not only different overall degrees of individualization as reflected in the number of "individualized" variables, but also different patterns and combinations of individualization, to the extent that these are found to occur.

7. Feasibility of the Sampling Procedure

The major practical difficulties that may be encountered in implementing the sampling plan outlined above are (1) obtaining a qualitatively and quantitatively adequate response from superintendents and principals and (2) obtaining accurate and useful information from teachers over the telephone.

With respect to the first problem, difficulties may be of two kinds. First, there may be a low response rate. This problem can be minimized by allowing in advance for sufficient manpower and funding to provide adequate followup. Second, superintendents as a whole may be unable to steer the contractor toward a sufficient number of schools which are likely to provide individualized instruction. If this seems to be the case, then it is suggested that the number of schools and teachers contacted at the next stage be adjusted upward, to ensure that a sufficient variety of program types will be available for the final sample.

With respect to the second problem, CRI has recently concluded a pilot telephone screening of teachers, and has concluded that the procedure is entirely feasible. Using an earlier draft version of the Telephone Screening Guide (see Appendix A), CRI talked with 40 teachers and one principal [1] in schools located in 26 states (see Appendix I for listings) after making approximately 75 initial inquiries to school principals.

Descriptive data on each of the 41 classrooms is presented in Exhibit III-1. Focusing on the data relevant to six[2] dimensions of individualization-standardization several observations can be made.[3]

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[1] The principal reported on the instructional practices of one of his third grade teachers who was unavailable because of the existence of a teachers' strike.

[2] The two other dimensions of individualization/standardization of instruction--social setting and pupil behavior--were not measured because the decision to include these variables was not finalized until near the completion of the telephone screening.

[3] The data from the telephone conversations were summarized in the following manner. A classroom was considered to be individualized along one of the dimensions if most or all students differed with respect to the prescription along the dimension (e.g., proceeded at different rates or used different materials when working on given objectives and the teacher reported that such decisions were based on the diagnosis of student ability, needs and/or student choice. A classroom was considered to be standardized along one of the dimensions if most or all received the same prescription with respect to this dimension and either no individual diagnosis occurred or the diagnosis was used as part of a diagnosis of the entire class group. A classroom was considered differentiated if the major differences in prescription for students with respect to the dimension occurred among different instructional groups, with most students within a group receiving the same prescription, and with diagnostic activities, if present, being used to divide students into instructional groups.

Classroom	Are students "pulled-out" of classroom for instruction in:		Dimensions of Individualization-Standardization for Math/Reading*					
	Math	Reading	Content	Sequence	Rate	Materials	Teacher Behavior	Physical Setting
1	No	Yes	D	D	D	S/D	D/D	S/S
2	No	Yes	D	I	I	I	I	I
3	Yes	Yes	D	D	D	D	D	D
4	No	Yes	I	I	I	I	D	S
5	No	Yes	D/I	I	I	I	I	I
6	No	Yes	I	I	I	S/I	D/I	S/S
7	No	No	I	I	I	I	I	I
8	Yes	Yes	D	D	D	D	D	D
9	No	Yes	I	I	I	I	I	I
10	Yes	Yes	D	I	I	I	I	I
11	Yes	Yes	D	D	I	D	I	D/I
12	Yes	Yes	I	I	I	I	I	I
13	No	No	D	S/D	S/D	S/D	I/D	S
14	No	Yes	D	D	D	D	D	I
15	No	No	S/D	S/D	S/D	S/D	S/D	S/D
16	No	No	D/S	D/S	I	D/I	I	I
17	No	Yes	D	D	D	D	D	D
18	Yes	Yes	D	D	D	D	D/I	S
19	No	No	D	D	D	D	D	D
20	No	No	D/D	S/D	S/D	S/D	I	S
21	No	No	D/I	D/I	D/I	D	D	S/I
22	No	No	D	D	D	D	I	D
23	No	No	D	D	D	D	D	D
24	No	Yes	D	D	D	D	D	I
25	No	No	D	D	D	D	D	D
26	Yes	Yes	D/I	D/I	D/I	D/I	D/I	D/I
27	No	No	D	D	I	D	D	D/I
28	No	No	D/S	D/I	I/D	D/I	I	D
29	No	No	D/I	D/I	D/I	D/I	D/I	D/S
30	Yes	No	D	D	D	D	D	S
31	No	No	S/D	D	I	D	D	S

EXHIBIT III-1. DESCRIPTIVE DATA ON LIST OF POTENTIAL SAMPLE CLASSROOM

17	No	Yes	D	D	D	D	D	D
18	Yes	Yes	D	D	D	D	D/I	S
19	No	No	D	D	D	D	D	D
20	No	No	D/D	S/D	S/D	S/D	I	S
21	No	No	D/I	D/I	D/I	D	D	S/I
22	No	No	D	D	D	D	I	D
23	No	No	D	D	D	D	D	D
24	No	Yes	D	D	D	D	D	I
25	No	No	D	D	D	D	D	D
26	Yes	Yes	D/I	D/I	D/I	D/I	D/I	D/I
27	No	No	D	D	I	D	D	D/I
28	No	No	D/S	D/I	I/D	D/I	I	D
29	No	No	D/I	D/I	D/I	D/I	D/I	D/S
30	Yes	No	D	D	D	D	D	S
31	No	No	S/D	D	I	D	D	S
32	Yes	Yes	D	D	D	D	D	D
33	No	No	S	I	I	D	I	S
34	No	Yes	S/I	S/I	S/I	S/I	S/I	S
35	No	Yes	D	D	D	D	I	I
36	No	No	D	D	I	D	I	D/I
37	Yes	Yes	S/D	S/I	S/I	S/D	S/D	S/I
38	No	Yes	D	D	D	D	I	S
39	DK	DK	D	D	I	D	D	S
40	No	Yes	D	D	D	D	I	D
41	Yes	Yes	D	D	D	D	I	D

* Symbols for math and reading are distinguished through separation with a "slash" (e.g., Math/Reading) if math and reading instruction do exhibit the same extent of individualization-standardization. Otherwise, one symbol, either "I", "S", or "D" is indicated for both math and reading.

I - Individualized (diagnosis, prescription, and implementation focuses on individual).

S - Standardized (diagnosis, prescription and implementation focuses on entire class).

D - Differentiated (practice representing middle point on individualizing-standardizing dimension, i.e., diagnosis, prescription and implementation focuses on sub groups of class).

First, three classroom teachers appear to be individualizing along each of the dimensions with respect to both math and reading instruction. Second, no teacher seems to standardize instruction along all dimensions for both math and reading, giving tentative support to our previously stated contention that all teachers attempt to "individualize" in some manner. Third, six teachers report instructional practices that fall between individualization and standardization (i.e., differentiation) along all dimensions for both math and reading. Fourth, most teachers seem to employ some combination of individualizing, differentating, and standardizing instructional practices, perhaps individualizing along one dimension and standardizing along others. Other teachers are consistent in their extent of individualizing-standardizing along the six dimensions for math, but employ instructional practices which are more or less individualizing for reading.

There are several conclusions that can be reached. First, information regarding the extent of individualization-standardization along several dimensions can be obtained from teachers via the telephone. Second, classrooms do differ with regard to the extent of individualization-standardization along each of our six (and presumably eight) dimensions, indicating the utility of conceptualizing individualization of of instruction as being multi-dimensional and the feasibility of constructing a sample containing classrooms that manifest a high degree of variation along the major independent variables in the study.

E. MEASUREMENT AND INSTRUMENTATION

1. Variables

The conceptual model presented earlier in this report has provided the framework for focusing the study on the variables that must be examined in order to answer the research questions that have been posed. This focus is necessary because the vast array of variables that might be examined with respect to any educational issue make it necessary to delineate those which are most important. This section of the report is designed to provide an orientation to the variables that CRI has selected to be studied. The variables have been categorized and will be presented as follows: process (individualization/standardization variables, and other process variables), outcome (achievement and non-cognitive), contextual and input.

a. Process Variables

Two genic types of process variables should be examined. The first type deals with the distinguishing characteristics of individualized and standardized instruction in terms of the eight dimensions of individualization/standardization that were briefly presented earlier. The second set of process variables are those that may differentially influence or mediate the nature and/or success of instruction across variability in individualization/standardization.

(1) Individualization/Standardization Variables

Individualization/standardization variables are derived from the definitions of individualized and standardized instruction. Included are the processes of (1) diagnosing student needs, (2) prescribing instructional treatments to meet those needs and (3) implementing the prescribed treatment, in terms of the eight dimensions of individualization/standardization.

As briefly mentioned earlier, CRI recognized that there are several ways a teacher can diagnose student needs and prescribe instructional treatments to meet those needs. These processes can be conscious or

unconscious, informal or highly structured. The number of variables, and the quality and types of data that are taken into account in making a diagnosis and prescription may vary considerably across programs. There may also be variation in terms of the frequency of diagnosis and prescription.

While these factors are undoubtedly important as concomitant variables in the analysis, in our conceptual scheme studying the different ways and rationales for diagnosing and prescribing does not help in differentiating individualized instruction from standardized instruction. In our conceptual scheme the critical concept related to diagnoses and prescription is the extent to which they occur at the individual student level. That is, the extent to which the individual student rather than the whole class or some sub group is the object of the diagnostic based prescription.

Individualization/standardization will be studied in terms of eight dimensions. These dimensions incorporate the basic ways in which instruction may vary. The extent to which any classroom is individualized/standardized can be described in terms of the answers to the following questions:

- Along what dimension(s) is/are individualized/standardized instruction occurring?
- What is the extent of individualization/standardization along this/these dimension(s)?
- To what extent is this variation based on individual vs. group diagnostic-based prescriptions?

In sum, classrooms can differ from each other in terms of the extent of individualization/standardization along any of eight dimensions. Additionally, classrooms can vary with respect to the number and type of dimensions which are either individualized or standardized. Hence, classrooms are not either "individualized" or "standardized," but are individualized/standardized in various ways and to varying extents.

The eight dimensions and their associated variable are now discussed in more detail:

(a) Content

The content dimensions of individualization/standardization is the extent to which different students proceed through different objectives. When this differential treatment is based on individual, diagnostic-based prescription, the treatment indicates a high degree of individualization.

This dimension is included in several models of individualized instructional programs (e.g., Bishop, 1971; Carmichael and Marshall, 1970; Wilhelm 1962). However, usually the emphasis has been on programs in the secondary schools, where students are often divided according to post-secondary school goals (e.g., vocational and science, social science, or humanities college preparation). We maintain that this dimension is relevant even in the early primary grades. Probably the most obvious way objectives vary among young students is that certain students proceed through additional or enrichment objectives in one subject area; presumably, other students receive enrichment in other subject areas.

(b) Rate

The rate dimension of individualization / standardization can be thought of as the extent to which different students are expected to proceed through identical objectives in different lengths of time as a function of individual, diagnostic-based prescription.

Allowing for variation in student's rate of achieving objectives is the way most teachers have attempted to individualize instruction (Association for Supervision and Curriculum Development, 1964; Rothrock, 1970). It also characterizes the oldest, modern era attempts to individualize instruction, i.e., the Winnetka and Dalton plans (Howes, 1970a). Such efforts are based on the assumption students learn at different rates, basically as a function of their different aptitudes (see Carroll, 1963).

Several authors have also included some form of the rate dimension in their model of individualization (e.g., Carmichael and Marshall, 1970; Devault and Kriewall, 1970; Gibbons, 1970 and 1971; Gronlund, 1974; Howes, 1970a; Wilhelm, 1962).

(c) Sequence

The dimension of sequence is the extent to which different students proceed through a given set of objectives in different sequences. Again, differential treatment related to sequence that results from individual, diagnostic-based prescription indicates a high degree of individualization.

This dimension is not very prevalent in the literature, primarily because most writers assume that all instructional programs exist within a context where there is a mandatory, specified sequence of objectives. (The sequence is rendered mandatory because the sub-matter dictates such an order logically and/or school officials prescribe a specific order for achieving objectives.) However, we concur with Devault and Kriewall (1970) that one way to individualize instruction is to vary the sequence of objectives that a student masters. We assume that some instructional programs incorporate this dimension and, importantly, that altering the sequence of mastering objectives may facilitate the achievement of some students. In other words, we propose that what might be the logical order of objectives for mathematicians, for example, may not be the most effective sequence of objectives in mathematics for certain students. (Variation in sequences of pursuing reading objectives probably is less heretical to reading specialists than similar variations in math objectives are to many mathematicians.)

(d) Materials

The dimension of materials is defined as the extent to which different instructional materials are utililized by different students who are working on the same objective. A high degree of variation of materials resulting from individual, diagnostic-based

prescription is the indicator of individualization along this dimension. This process is sometimes facilitiated by guides that cross reference instructional materials with respect to specific instructional objectives. Variation in materials can be achieved by using different books and learning aides with different kinds of students in order to achieve the same instructional objectives. The full range of the types of instructional materials should be considered including audio-visual materials, workbooks, resource materials, programmed texts, hardware, etc.

(e) Teacher Behavior

The dimension of teacher behavior is the extent to which a teacher relates to one student in a different manner than he/she relates to some other student when these students are working on the same objective. For example, a teacher may find that certain students respond to lectures, presentations, tutoring, etc.. In short, any different way a teacher behaves with respect to different students can be considered as a potential technique for individualizing instruction if the differential treatment is congruent with the diagnosis and prescriptions. In order to eliminate as much overlap and confusion as possible between the teacher behavior dimension and other dimensions, the teacher behaviors that are to be considered under this category are: (1) makes oral presentation, (2) gives demonstration, (3) facilitates discussion, (4) tutors, and (5) is not actively involved with students.

(f) Student Behavior

The student behavior dimension is the extent to which different students engage in different activities while proceeding through identical objectives. A high degree of variation in student behavior, resulting from individual, diagnostic-based prescription is the indicator of individualization along this dimension.

Here the particular student behaviors that are of interest are: whether the student is reading (silently or aloud), writing, talking, listening, observing, and/or manipulating some object other than

for purposes of reading and writing. In short, varying what the student does in the classroom is one means for using information about the student as an index of differential treatment.

(g) Social Setting

The social setting dimension is the extent to which different students who are working on the same objective are assigned to work with different members of the teaching staff or other students as a function of identified characteristics of students and staff members. The question here is who works with whom given teacher diagnosis and prescriptions. For instance, is Johnny assigned to work with another student because she/he has complimentary learning abilities, is Johnny assigned to a small group of culturally similar students, does he work by himself, with a teacher's aid or does he work directly with the teacher.

In sum, variations in social settings must be germane to specific characteristics of individual students and the students must be working on the same objective in order for the social setting to be considered individualized. Further, the variations must be overt and intentional.

(h) Physical Setting

Finally, it is entirely possible that some students work better in one type of physical setting whereas other students learn better in a different type of setting. Physical settings can vary with respect to such macro variables as whether instruction is provided indoors or outside. It can also vary with respect to changes, within the classroom such as whether the students work at desks, on the floor, at tables, in carrels, or at a learning center. Perhaps the most important variation in physical setting occurs when compensatory education students are physically removed from the classroom for reading and/or math instruction. This variation is important because a "pull out" program combines the use of a separate physical setting with a social setting that is comprised of all compensatory education students.

Therefore, the physical setting dimension is the extent to which different students, who are working on identical objectives, are assigned to different physical settings. Again, this differential must be based on the unique needs of individual students in order for this variation in treatment to be considered as a means of individualizing instruction.

(2) Other Process Variables

The second set of process variables that should be measured are those that are likely to influence the outcome of any type of instruction, to help describe the type of instruction being offered or to differentially affect the individualization processes. The variables in this cluster include whether compensatory education students receive reading and math instruction in their regular classroom or in a special laboratory setting apart from their regular classmates; total amount of instructional time in reading, mathematics, and the areas related to reading and mathematics (such as social studies and science); student-teacher-aide ratios; the number of different students seen by each teacher per day; the amount of time teachers are given for planning; the type of inservice training given to teachers in order to help them maximize the effectiveness of whatever program they are employing; the procedures employed for monitoring student progress (such as by the use of periodic objectives based tests); the nature of student involvement in planning their own programs; the system of record keeping, the content of records kept on each student and the frequency with which they are updated; the degree of parent involvement; etc.

Other process variables that appear to be extremely important are related to teacher/student and student/student interactions within the classroom. For example, the use of praise, punishment, feedback and other teacher behaviors may possibly be monitoring behaviors that enhance the success in one type of program or another. Student/student interactions such as students talking to other students in class (related and non-related to instruction) will also be assessed. The use of physical

environment of the classroom, in terms of its furniture, materials, etc., may be important moderating variables. These types of variables are more completely discussed in a later section which discusses classroom observation instruments.

b. Outcome Variables

The selection and operationalization of relevant outcome variables is a critical feature of the study design. If the study is to provide a meaningful basis for comparing existing program dimensions for the purpose of drawing policy implications, then the outcome variables must reflect important educational objectives applicable to a wide variety of programs. CRI feels that there are two ways that this can be accomplished. First, in selecting measures of academic impact, every attempt should be made to include tests which measure student achievements that constitute central objectives in most or all reading or mathematics programs at grade level. They should insofar as possible favor no one set of curricula, instructional materials or methods over any other.

Second, the outcome variables should include non-cognitive dimensions, such as student and teacher attitudes and classroom interaction variables. These dimensions constitute important educational objectives in and of themselves, and have the additional attractive property that they can be appropriately measured independently of the particular achievement objectives embodied in a program.

As suggested in the RFP, two types of outcomes are considered:

- achievement in math and reading and
- classroom environment which CRI takes to mean non-cognitive outcomes

The former is of central importance, especially given the thrust of compensatory education programs. However, the importance of the latter type of outcome, which we interpret very broadly, is not to be underestimated for three reasons. First, it is probable that the first years of schooling not only begin the process of subject matter instruction but also are important in shaping children's attitudes towards themselves

and toward the schooling process. Furthermore, the long term effects on subsequent achievement of these attitudes may be equally, if not more, potent than the long term effects of early subject matter learning. Thus, classroom environment or non-cognitive variables must be considered.

Second, it may be that certain patterns of individualized or standardized instructional programs produce equal student achievement (in the short run) but have varied impacts on other attitudes and behaviors of students and staff members. The inclusion of non-cognitive outcome measures, then, provides a further basis for distinguishing the effects of different kinds of instructional programs. It seems reasonable to suggest that educational decision-makers, when presented with a choice of implementing either of two instructional programs, each of which is purported to produce equal math and reading achievement in their type of school context, would select the program that produced other types of positive outcomes. Given that one of the purposes of the proposed study is to provide information for such choices, it is imperative that these other non-cognitive variables be incorporated.

Third, these extra-cognitive factors should be expected to have initial independent effects on compensatory programs. It is safe to assume that some attitudes students bring to class inhibit while others enhance learning. Further, some types of attitudes may foster some program processes, while inhibiting or having negligible effects on others.

(1) Achievement

Personalistic impressions (for example see Darrow and Howes, 1960) usually have favored some type of individualized instruction for enhancing of achievement outcomes. However, the reviews of available research on the effects of individualization in terms of math achievement (e.g., Weaver, 1966) and reading achievement (Groff, 1970; Seeber, 1969) is not as conclusive. First, some of the studies did not support the superiority, finding no significant differences or an indication that some other method produced better results. Second, even if the findings were more uniform, the findings would be far from

conclusive, because of inadequate research designs. Previous research is notably weak in sampling and control procedures, and program descriptions have been so sketchy that it's impossible to tell whether or in what way "individualized" programs varied.

The major issues concerning math and reading achievement involve questions of measurement. Some of the relevant questions are: What kind of an instrument will be administered? What does the instrument measure and how validly? For instance, does the reading test assess exposure to certain vocabularly, which is highly dependent on specific kinds of reading, and thus does not really measure reading skill? Similarly, does the test require fluency in a certain language or dialect that biases the results against certain groups of children? Does the math test really measure understanding of mathematical concepts and ability to perform math operations or does it assess familiarity with certain kinds of experience, or does it basically assess read reading ability? These issues are dealt with more fully in the instrument section of this report.

(2) Non-Cognitive Student Outcomes

There are five attitudinal dimensions that are potentially affected by a student's experience in a type of individualized or standardized instructional program. First, students develop attitudes about the subject matter (in this particular case the focus is on math and reading), and it is probable that such attitudes have some impact upon as well as being impacted upon by a student's achievement in the subject area. Darrow and Howes (1960) contend that individualized instructional programs foster more positive attitudes toward the relevant subject matter (via, reading) then supposedly non-individualized programs.

Second, as a result of their experience in different types of instructional programs students develop attitudes about school. Some students may like attending school, in fact, they may prefer it to staying home or playing in the neighborhood, while other children have a negative attitude toward school attendance.

In addition, to assessing this attitudinal dimension via attitude scales (especially measures of enjoying school or anxiety toward coming to school), the following variables might be used as indicators of attitude to school attendance:

- the degree to which staff members perceive a prevalence of discipline problems; and
- the proportion of students absent (or truant) during a given period of time.

There is some evidence that "individualized" instructional programs tend to reduce the absence rate among students (Darrow and Howes, 1960).

Third, students' attitudes toward their peers emerge. Students can feel friendly toward their classmates or wish they were in a class with other children. It is uncertain whether individualization affects such attitudes. Perhaps the tendency in individualized programs to have less group learning experiences, an occurrence that Larson (1973) reports is not favorably accepted by many students, has an impact on the degree of liking within the class group. (Homans (1950) postulates, for instance, that interaction results in stronger affect. Thus, the reduction of interaction in individualized classrooms, if such obtains, may reduce feelings of liking and disliking among classmates.) By way of contrast, it may be that students in individualized programs form a more cohesive group, in that when students are allowed to proceed through objectives at their own rate there is less reason for negative feelings toward peers because they are causing the class to move too slowly or too fast.

Larson (1973) presents a finding relevant to this point. In a study of an "individualized" versus a "standardized" math instructional program in Sweden, he found that students in the "individualized" program were highly favorable to the practice of taking prognostic tests immediately after completing an instructional unit, basically because

they didn't have to wait for others. Thus, negative feelings towards peers may develop if students see their peers as responsible for delaying the "completion" of their own work.

Fourth, there is the area of attitudes toward self. This attitudinal dimension consists of two major subcategories: Self concept and locus of control. Although both variables have been conceived of as antecedents of academic achievement (see for example, Coleman et al., 1966) they can also be thought of as outcomes from certain schooling experiences, especially in the early grades.

Self-concept is an important outcome, especially because of its potentially large effect on later educational and occupational achievement. "Individualized" instructional programs are reported to foster better self-concepts that "non-individualized" programs (Darrow and Howes, 1960; Stahl and Analazone, 1970), presumably, because no student is labeled as "slow" (Carlton and Moore, 1970).

Although locus of control is usually dichotomized into those persons who think they can control what happens to them (internals) and those who cannot (externals), the more useful distinction may be between those people who internalize success and externalize failure versus those who externalize success and internalize failure (cf., Weiner, 1972). It is assumed that by providing for individual differences a program can foster a more productive perception of locus of control among students (see Bishop, 1971).

A fifth dimension is student attitudes toward staff members, which is one aspect of what is popularly called student-teacher relations. This is an important outcome if only because of the great amount of time which students spend with school personnel and thus indicates the quality of student life. Darrow and Howes (1960) report that "individualization" enhances student-teacher relations.

(3) Non-Cognitive Teacher Out[illegible]s

Educational decision makers need to be apprised of the impact of instructional programs on teachers and other staff

members for two reasons. First, the way teachers are affected has consequences for the way students are treated. Teachers who are not satisfied with their situation are not likely to be effective with or pleasant to their students. Potentially, dissatisfied teachers can have a deleterious effect on their students. Second, given the emergent strength of teachers' unions educational decision makers must focus their attention to teachers' needs and reactions in order to maintain a smooth operation.

There are four major attitudinal dimensions that comprise the teacher outcomes. First, as implied above, there is the dimension of teacher attitudes toward students. Some teachers like their students and others are not happy with the members of their class and manage to escape from their company as often as possible. Perhaps the type of individualized program affects such teacher attitudes.

Second, attitudes toward colleagues is also an important dimension. The nature of colleaguial relations has been shown to affect students (McPherson, 1972), and therefore if certain kinds of individualized instructional programs, because of time and organizational demands, have a negative effect on colleaguial relations, then educational decision makers need to be aware of this.

Third, there is the area of teacher attitudes toward their job and the school. Again, if different kinds of instructional programs differentially influence teacher attitudes toward their job, then such information would prove useful to educational decision makers.

Fourth, teachers have attitudes about their own effectiveness as teachers. Teachers vary on the extent to which they attribute student success or failure to their own teaching performance. The more individualized programs, particularly if they are more or less successful may enhance a teacher's internal sense of effectiveness. This variable, teacher locus of control, is discussed in more detail under input variables.

c. Context Variables

Contextual variables refer to aspects or factors

which describe the extra-classroom instructional environment or background conditions. The single most important contextual variable is likely to be the amount of resources expended on individualization and instructional staff including related costs associated with teaching. It does not include many other items that are often grouped under the heading of "instructional expenses" unless they are specifically targeted to reading or mathematics instruction. It should be recognized, however, that "per capita expenditure" may not be linearly related to either the extent of individualization or level of student performance (McDermott & Klein, 1974). The reason for this is that having more money or time to spend on instruction does not guarantee that it will be spent wisely. On the other hand, the availability of funds and support staff may have an important bearing on the form or nature of the kind of individualized instruction that is implemented. For example, when funds are plentiful, instruction might be individualized by varying materials or physical settings, whereas when funds are limited, individualization might be achieved by variations in teacher techniques (such as the use of student tutors).

Another set of contextual factors that should be examined involves district and community attitudes towards individualization. For example, are parents supportive of the idea that students should be treated differently relative to their respective characteristics or are they opposed to such differentiation? To what extent is there community involvement in compensatory education advicement? As an index of community involvement, the existence, size and attendance of compensatory advisory committee meetings should be ascertained, including the extent and type of responsibility involved.

The research effort should also be allerted to regional and urban rural distinctions. District and school characteristics may also be important, e.g., number of pupils served, structure or extent of centralization of authority and status of school integration. The researchers should inquire about school staff rapport, and the extent and kind of control over the selection of instructional programs. Principals and staff who feel they have active control over how they

fulfill their responsibilities are more likely to effect positive outcomes than those who feel helpless to anonymous authority or remote district bureaucrats.

Compensatory education program characteristics per se should be analyzed as a major set of contextual variables. The investigators should attend to district and school enrollment (e.g., ethnicity and grade level breakdown), sources and amount of funding and the total number and breakdown of compensatory education staff. Larger concentrated program efforts are likely to have different effects than smaller more isolated efforts.

d. Input Variables

In order to understand how individualized instruction operates, it is important to consider what it operates on. What are the student and staff "givens"? Input variables, then, refer to aspects of the class itself that are thought to affect outcomes whether directly or through interaction with program variables.

Certain kinds of students may profit most from certain types of instruction whereas other kinds of students may achieve more from a different type of instruction. In recent years, this has been referred to as "aptitude-treatment interaction". At the present time, there is no clear indication of the nature of the student characteristics that differentiate between those who profit most from varying types of instruction. This may be due to failure to focus on the right student attributes and/or to identify truly different types of instructional programs and/or to gather and analyze the data in a manner that will facilitate finding these interactions (such as the use of multiple moderators). On the other hand, teachers may be more willing to implement certain types of instructional programs with particular kinds of students than they are with other kinds of students. Thus, it seems advisable to collect data on students' academic abilities, sex, ethnicity, socioeconomic status, and related factors in order to determine which types of programs are generally used with which kinds of students as well as which kinds of programs are most successful with which kinds of students.

The set of student characteristics which needs to be tapped includes:

- Demographic factors (age, ethnicity, birthplace, sex, etc.)
- Pretest academic achievement (Reading and Math)
- Non-cognitive variables
- Native language

Likewise, relevant staff characteristics should also be measured. They are:

- Demographic factors
- Academic background (degree and any special training)
- Languages spoken
- Non-cognitive variables

Teachers' attitudes and abilities are, of course, critical. Some teachers may be more willing or able to serve as classroom managers rather than instructors per se, some may be more tolerant of the seeming disorder associated with certain forms of individualized instruction, etc. Similarly, some teachers may have had specific training in using individualized techniques, worked with teachers who have used these approaches, have tried the techniques themselves in other classes or subject matter areas, etc. Finally, teachers' attitudes towards their students and the manner they feel most comfortable in relating to these students will have a bearing on the extent to which these teachers are willing to expend the initial extra effort required to achieve individualized instruction. For example, a standardized classroom program would make it easier for a teacher to maintain social distance with students and their families than would an individualized program.

The manner in which teachers explain student performance can influence what they do in the classroom. If they view student performance as due mostly to factors outside of their control, then they may

experience a sense of powerlessness. Teachers will derive little reward from student successes if they cannot see how they are related to teaching and will be at a loss as to what to do about poor student performance if they think it is due to forces beyond their control. The students, who are on the other side of this, may be confused and discouraged by their teachers' behaviors. If teachers do not feel their teaching can really affect student learning they may act in an inconsistent manner trying one technique on one day, a different approach on another day and not even trying on a third day. On the more positive side, if the teachers make it clear to the student that they believe that they can control their own outcomes, it may help them to develop a sense of potency in the school setting.

If, on the other hand, teachers believe that they are mostly responsible for the successes or failures of their students, they can get a great deal of reinforcement for teaching when students are doing well. This can be countered by the self-doubt generated when students do poorly. If the teacher takes credit for a student's good performance then the student can be denied the material for making internal attributions for his good work. At the same time, if the teachers take responsibility for the student's poor achievement, they may be helping them maintain a good self concept and strong motivation in the face of failure.

Some recent experimental research has indicated that teachers have different explanations for student failure than they have for student success. It seems that the teachers in these studies generally attributed student success to their good teaching and attributed poor student performance to the student's lack of ability or effort. CRI has taken this finding into account in designing the Teacher Locus of Control Inventory.

Classroom program and facilities should also be taken into account, e.g., non-graded or open versus traditional classroom. Goodlad and Anderson (1963) repopularized the notion of schools without age-graded classrooms. The rather well supported assumption

being that there is as much variation in ability, interest, etc., among similar age students as among an age-heterogenous group of students. The thrust was to break the lockstep graded curriculum, primarily to allow students to proceed at their own pace. Not surprisingly, such a school organization has been seen to facilitate efforts to individualize instruction (see Anderson, 1962; Bishop, 1971; Gronlund, 1974).

It is assumed that implementing individualized instructional programs (especially those that attempt to provide for variation in instructional settings) is facilitated to the extent to which physical facilities and equipment allow for flexibility in size and structure of instructional settings. Presumably, in schools where most classrooms are the same size and cannot be partitioned adequately, it is more difficult to individualize instruction.

2. Instruments

In order to measure the variables that are defined and described in the preceding section, CRI has selected or developed a number of measurement instruments. Where possible, previously published or previously employed instruments were chosen. Selection was based on criteria relating to reliability, validity, appropriateness to population and form and ease of administration. These criteria are detailed in the forthcoming discussions of each instrument or set of related instruments. Where no previously tested and validated instruments existed which allowed for measuring variables as they are operationally defined, CRI developed appropriate measurement techniques. The rationale underlying the development of these instruments accompanies the description of each. Exhibit III-2 outlines the variables in terms of the conceptual organization of this study. The instrument(s) that should be used to assess each of these variables is also given.

Exhibit III-2: Variables and Associated Measurement Techniques

VARIABLES MEASURES	INSTRUMENTS
I. Process Variables A. Key Variables that Distinguish Individualization vs. Standardization 1. Rate 2. Content 3. Sequence 4. Materials 5. Teacher Behavior 6. Student Behavior 7. Social Setting 8. Physical Setting	Student Activity Log and Teacher Inter-Interview II
B. Other Process Variables 1. Diagnosis and Prescription a. Frequency of diagnosis and prescription. b. Formality/informality of diagnosis and prescription. c. Student attributes considered in diagnosis and prescription. d. Use of diagnostic info in making curricular prescriptions. e. Student involvement in diagnosis and prescription.	Teacher Interview I
2. Utilization of Instructional Personnel a. Utilization of aides. b. Utilization of cross-age tutors. c. Utilization of certified teachers. d. Utilization of curriculum specialist.	Teacher Interview I

Exhibit III-2: Variables and Associated Measurement Techniques

VARIABLES MEASURED	INSTRUMENTS
3. Classroom Management	
a. Adult/student ratio.	Teacher Interview I
b. Number of different students teacher instructs.	
c. Physical location of reading and math instruction.	
d. Use of homogeneous vs. heterogeneous grouping.	
e. Formal scheduling of teacher time for instructional planning.	Teacher Interview II
f. Instructional time devoted to reading and math.	
4. Student Progress Reporting to Parents	Teacher Interview II
a. Nature of reporting.	
b. Frequency of reporting.	
5. Instructional Personnel Training	
a. Special training of math and reading teachers.	Teacher Interview I
b. Inservice training emphasis on individualization.	Teacher Interview II
6. Student/Teacher Interactions	Classroom Observation Instrument (Five Minute Observation)
a. Variety and type of teacher student interactions such as percent of time teacher engages in disciplining versus instructional activity.	
b. Teacher use of praise and punishment.	
c. Number of teacher interactions with individuals versus groups.	

Exhibit III-2: Variables and Associated Measurement Techniques

VARIABLES MEASURED	INSTRUMENTS
7. Classroom Decor a. Variety of instructional equipment and materials. b. Displays of student products and personal items. c. Displays reflecting student ethnicity.	Classroom Observation Instrument (Physical Environment Information)
8. Classroom Activity Pattern a. Distribution pattern of adults and students. b. Activity pattern of adults and students. c. Pattern of material usage.	Classroom Observation Instrument (Classroom Check List)
II. Outcomes A. Reading Achievement	Metropolitan Achievement Test, Primary I Word Knowledge (Subtest) Reading (Subtest)
B. Math Achievement	MAT, Primary 1 Math Concepts (Subtest) Math Computation (Subtest)
C. Student non-cognitive outcomes 1. Attitude toward subject matter. 2. Attitude toward peers.	1. * "About the things we Learn" 2. * "About Other Children and Me"

* Scale of School Attitude Survey

Exhibit III-2: Variables and Associated Measurement Techniques

VARIABLES MEASURED	INSTRUMENTS
3. Attitude toward teacher.	3. * "About the Teacher and Me"
4. Attitude toward school.	4. * "About Me and My Classroom"
a. Student Attendance.	a. Teacher Interview
b. Student Discipline Problem.	b. Five Minute Observation
5. Attitude toward self.	5. Piers-Harris Children's Self Concept Scale
6. Locus of Control.	6. Student Locus of Control Measure (CRI)
D. Teacher non-cognitive outcomes	
1. Attitude toward students.	1. Minnesota Teacher Attitude Inventory
2. Attitudes toward colleagues, job and school.	2. Purdue Teacher Opionnaire
3. Locus of control.	3. Locus of Control Inventory for Teachers (CRI)
III. Context Variables	
A. Urban/rural school	Sample Characteristics
B. Geographic region	
C. Class size	Teacher Interview I
D. Number of pupils served by district	Principal Questionnaire
E. Status of school integration	
F. Groups involved in selection of instructional programs	

* Scale of School Attitude Survey

Exhibit III-2: Variables and Associated Measurement Techniques

VARIABLES MEASURED	INSTRUMENTS
G. School enrollment H. Sources and amount of compensatory education funds I. Number and breakdown of compensatory education staff J. Parents' attitudes toward schooling K. Cost per pupil of program L. School staff rapport	Principal Questionnaire
M. Staff involvement in school level decisions	Principal Questionnaire
N. Parent involvement and influence on school level decisions	Teacher Interview II
O. Length of time program in operation P. Parent Support of instructional program	Teacher Interview II
IV. Input Variables A. Reading Achievement	Metropolitan Achievement Test, Primary 1 Word Knowledge (Subtest) Reading (Subtest)
B. Math Achievement	MAT, Primary 1 Math Concepts (Subtest) Math Computation (Subtest)
C. Student Non-Cognitive Inputs 1. Attitude toward subject matter 2. Attitude toward peers	* "About the Things We Learn" * "About Other Children and Me"

*Scale of School Attitude Survey

Exhibit III-2: Variables and Associated Measurement Techniques

VARIABLES MEASURED		INSTRUMENTS
	3. Attitude toward teacher	* "About the Teacher and Me"
	4. Attitude toward school	* "About Me and My Classroom"
	5. Attitude toward self	Piers-Harris Children's Self Concept Scale
	6. Locus of Control	Student Locus of Control Measure (CRI)
D.	Teacher Non-Cognitive Outcomes	
	1. Attitude toward students	Minnesota Teacher Attitude Inventory
	2. Attitudes toward colleagues, job and school	Purdue Teacher Opinionnaire
	3. Locus of Control	Locus of Control Inventory for Teachers (CRI)
E.	Student Demographic factors	Metropolitan Achievement Test
F.	Class transiency rate	Student Activity Log
G.	Student native language	Teacher Interview I
H.	Teacher demographic factors	
I.	Teacher academic background	
J.	Languages spoken by teacher	
K.	Criteria for assigning students to classes (graded/non-graded)	Principal Questionnaire
L.	Flexibility of classroom facilities	Physical Environment Information
M.	Presence of a variety of instructional materials	
N.	Degree classroom is scaled to students	
O.	Presence of a variety of toys, play equipment, etc.	

* Scale of School Attitude Survey

a. The Student Activity Log

The Student Activity Log is a technique CRI has devised to measure the extent of individualization/standardization within the classroom. These processes are operationally defined by variation along the eight dimensions of (1) content of objectives, (2) rate at which different students proceed through the same objectives, (3) sequence of objectives, (4) materials used by different students on the same objectives, (5) teacher behavior, (6) student activity, (7) social setting and (8) physical setting. Measurement of these variables is problematic for two major reasons.

- These phenomena are manifested over an extended period of time. For example, it would take several weeks or months to accurately assess whether all students, some students or no students work on objectives in the same sequence.
- The visible behaviors which accompany these variables must be referenced to the specific objective a particular pupil is working on. For example, if several students are using different materials at a given time, it is not an indication of variation in materials as defined earlier unless the students are working on the same objective.

CRI feels that these problems preclude the use of in-depth observation as a means of obtaining data on degree of individualization of instruction. In the first place, the long term observation by research staff members which would be necessary to measure the crucial variables would be prohibitively expensive. Secondly, even if cost were not a factor classroom observation can only record the physical events in the classroom. The observer would not be able to link behaviors to specific objectives without constantly consulting the teacher and intruding upon the class. CRI believes these problems can be resolved best by involving classroom teachers as participant-observers in their own classrooms to collect data on these dimensions.

The Student Activity Log and related materials comprise a kit which is designed to enable teachers to make systematic records of the activities of students in their classroom in a simple, straightforward manner. The Log, included in Appendix F, has space for the names of all students in the class and a set of objectives for either reading or math. The list of objectives is developed by the teacher in conjunction with a Project Staff Member and is specific to her/his class. On the Log, the teacher records the date on which each student begins any objective on which that student may work, the date the student completes the objective and the approximate number of hours spent on that objective. Using code symbols, the teacher also indicates any materials, physical settings, social settings, teacher behaviors and student behaviors associated with that student's work on a particular objective.

To facilitate teachers' recording of this information, Coding Keys are provided in the Kit along with instructions for using the Log, also included in Appendix F. The Coding Key contains standard items and codes for teacher behavior, social setting, physical setting and pupil behavior. Since there is tremendous variation in materials among classrooms, each teacher will be aided in constructing a list of materials appropriate to his/her class. Information on scoring and analysis of the Log in conjunction with the Teacher Interview II is included in Appendix G.

Once the Log is set up and the teacher is familiar with the codes and use of the Log, the actual recordings will require a minimum of teacher time and effort. This is important in maintaining teacher cooperation and accurate, up-to-date records.

CRI recognizes that having teachers participate as members of the research staff, collecting data about the instructional processes in their classrooms can introduce a major source of bias in the results of the study. If teachers are asked to make many inferences about the nature of the instructional process that is obtained in their classroom, they are apt to do so in a way that positively biases the picture of their classroom. The Student Activity Kit drastically

reduces this problem by providing a format allowing for only highly objective information which is descriptive rather than evaluative in nature. In addition, as part of the Teacher Interview I, the Project Staff Member will be emphasizing to the teacher that his/her classroom was selected for this study because of the way it is organized and that there are no preconceptions of how effective different organizations are. While there may be a bias in the educational community toward individualization CRI feels that the possible desire to look individualized will be offset by the fact that it is easier for the teacher to fill out the log to reflect a more standardized program by grouping students and making a single entry for the group's activities.

While the use of the Student Activity Log Kit resolves the problems of using teachers to collect objective data about their own classrooms, it presents one major problem -- how will the cooperation and diligent efforts of teachers in the sample be assured. CRI believes that this can be addressed in two ways. First, by paying teachers ($100) for their involvement, part of the motivation problem should be overcome. However, even when individuals receive financial renumeration they often fail to complete their assigned tasks adequately or on time. This is especially relevant in the case of teachers who have tremendously time consuming responsibilities to begin with. Therefore teachers should be requested to send in copies of their Log at the end of each week. Making copies will be accomplished through the use of pressure sensitive paper. Having teachers send their logs will allow project personnel to keep track of whether or not teachers are keeping their logs up to date and to provide feedback to teachers who may be having difficulties.

In addition to serving as a technique to enable teachers to systematically gather data, the introduction of the Student Activity Log into the classroom can be conceived of as a treatment, potentially having some effect on the nature of classroom practices and/or the amount of learning that occurs. CRI does not believe that this is a serious problem since all classrooms in the study are given the same

"treatment." CRI's position is that the impact of the Student Activity Log will be uniform across classrooms, regardless of the degree of individualization. If, in fact, the introduction of the kit into classrooms enhances achievement uniformly, then so much the better. CRI believes that research efforts should have direct payoffs for those being studied, and a more immediate payoff than enhancing student achievement during the course of the study (and perhaps subsequently) does not exist.

b. Classroom Observation Instrument (COI)

While observation of classrooms is deemed inappropriate for measurement of the process of individualization it is a highly desirable technique for obtaining information on other process variables, input variables and outcomes. Specifically, observation should be used to describe the physical characteristics of classrooms including flexibility of space, presence and use of various instructional materials and play equipment. Observation should also be used for noting the presence of materials which reflect personal characteristics of students. General teacher behaviors such as the use of reinforcement and responsiveness to students as well as whether the teacher interacts with individual students or groups should also be recorded. Additionally, observations should be made of the different sizes of groups in which students work, the activities associated with these groups, the presence of adults in groups of students and the physical settings in which the groups work.

The COI is a three part observation instrument developed by Stanford Research Institute (SRI) for Project Follow Through (Stallings and Kaskowitz, 1973). It was designed to describe classroom features activities and interactions. CRI previously employed this instrument successfully in its study of Teacher Corps Projects (Marsh, et. al., 1973), and feels that of the great number of classroom observation instruments available (See Medly & Mitzel, 1963), the COI is the most appropriate for the present study. Some of the reasons for this decision are listed on the following page.

- The COI has been shown to have high interobserver reliability. (0.82 when calculated as a percent of agreement with two raters rating the same phenomenon).
- SRI has an established intensive program for training observers in the use of these instruments.
- Nearly all of the data collected by the COI is low inference which promotes accuracy as well as reliability.
- The instrument allows for intense observation of interaction between teacher and students. This is highly desirable for providing a rich description of these behaviors.
- The instrument was designed originally for observation of third grade classrooms which are also the object of observation in this study.

The COI contains three sub-parts; a Classroom Check List, Physical Environment Information, and Five-Minute Observation-as described below:

(1) Physical Environment Information (PEI)

The Physical Environment Information section provides a form for coding information about the classroom setting including the presence and use of specific equipment, instructional materials, games, toys and displays in the room. Additional recordings include whether the classroom has movable rather than stationary desks, chairs and tables, and whether seating and group composition are assigned by the teacher or selected by the students. The extent to which furnishings and facilities in the room are scaled to children as well as the presence of personalized displays such as student products and photographs is also recorded.

(2) Classroom Check List (CCL).

The Classroom Check List is to be completed four times an hour. It provides a description of the classroom at a given moment in time. This "snapshot" records the activities engaged

in and the distribution of all adults and students in the classroom. Information is gathered on the size of various groupings of students and adults as well as the particular activity they are occupied with. In this way, a number of simultaneous activities can be mapped. The materials being used in each activity are also recorded.

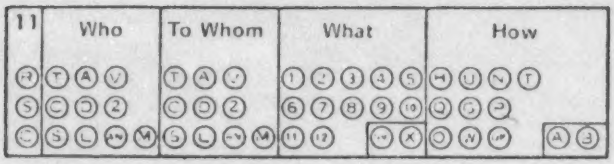
(3) The Five-Minute Observation (FMO).

The Five Minute Observation allows for comprehensive recording of the activities and interactions of any designated person in the classroom. Four times each hour an adult or child in the classroom is selected and becomes the focus of observation for five minutes. Each unit of interaction in which the focus person is either the actor or the recipient of some action is recorded in a separate frame of the instrument. (See Exhibit III-3 for a sample frame). Over the five minute period at least 50 and up to 76 frames are filled out about the focus person. If one frame records that the focus person engages in an action that calls for or elicits a response, the nature of the response or the absence of an appropriate response is recorded in the subsequent frame. If the focus person's action does not call for a response (e.g. teacher lecturing) then the next frame is used to follow the primary action.

Each recording frame is designed to collect four categories of information.

- Who is acting?
- To Whom is the action directed?
- What is the action?
- How is it done?

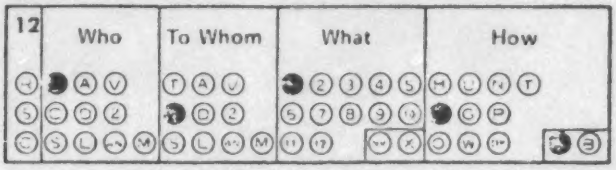
A listing of the contents of each of these coding categories is found in Exhibit III-4. It can be seen that the Who and To Whom categories contain the same items and allow for groups as well as individuals to be either actor or recipient. The What category includes verbal and non-verbal actions as well as inaction (e.g. Waiting or No Response).



A complete interaction sequence will take two or more frames showing at least the initiation of an interaction and the response to that initial interaction. An example of an interaction sequence is shown below.

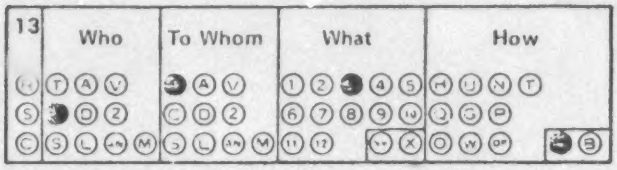
Teacher: "Johnny, what is two and two?"

The teacher (T in the Who column) is initiating an interaction with a child (C in the To whom column) by asking a simple question (1Q in the What and How columns). (A more detailed explanation of the codes appears in Appendix D.) This is coded in shorthand as TC1QA. It is coded in the frame as shown below.



Johnny: "It is four."

Johnny (C in the Who column) responds (3A in the What and How column) to the teacher (T in the To whom column). This in shorthand is CT3A. It is coded in the frame as shown below.



Teacher: "That is correct, Johnny."

The teacher (T in the Who column) tells Johnny (C in the To whom column) that she acknowledges (7A in the What and How column) his correct response. This in shorthand is TC7A. It is coded in the frame as shown below.

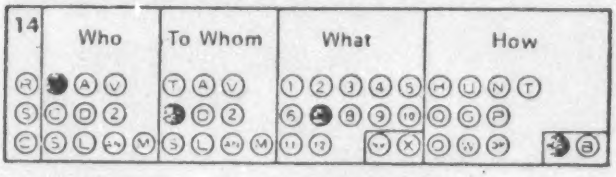


Exhibit III-3. CODED FMO FRAMES SHOWING CODING OF A TYPICAL INTERACTION

(From Stallings & Kaskowitz, 1973)

WHO and TO WHOM

Categories	Code
Teacher	T
Aide	A
Volunteer	V
Child	C
Different child	D
Two children	2
Small group	S
Large group	L
Animal	An
Machine	M

WHAT

Category	Code
Command or Request	1
Direct Question	1Q (Q from How column)
Open-Ended Question	2
Response	3
Instruction, Explanation	4
General Comments/General Action	5
Task-Related Comment	6
Acknowledge	7
Praise	8
Corrective Feedback	9
No Response	10
Waiting	11
Observing, Listening	12
Nonverbal	NV
Movement	X

HOW

Category	Code
Happy	H
Unhappy	U
Negative	N
Touch	T
Question	Q
Guide/Reason	G
Punish	P
Object	O
Worth	W
Dramatic Play/ Pretend	DP
Academic	A
Behavior	B

EXHIBIT III-4. FMO CODING CATEGORIES

The How category is used to modify the What notation. For example, a teacher can provide corrective feedback to a child in a positive way or a negative way. The feedback can be about the child's general behavior or deportment, or it can be about some academic endeavor.

The FMO captures the essence of an event independent of the specific content. For example, if a teacher is the focus person and he/she says to a student "Sally, you did very well on that addition problem" the event would be coded as TC8A which translates to "Teacher praises child for academic subject matter." The same code would be used regardless of the nature of the subject matter or who the specific child is.

Of the many thousands of variables that can be extracted from data collected by the FMO, only a small subset are relevant to this study. Below is a partial list of variables which CRI feels should be derived from the classroom observation data. The list demonstrates the types and range of events which the FMO can be used to measure, as well as the relevance of these events to variables such as teacher behavior, student activity, student attitude toward self, teacher attitude toward children and pupil attitude toward teacher.

1. Teacher addresses, instructs or responds to one child
2. Teacher addresses, instructs or responds to two children.
3. Teacher addresses, instructs or responds to small group.
4. Teacher addresses, instructs or responds to large group.
5. Teacher praises child (children).
6. Teacher gives negative corrective feedback
7. Teacher gives positive corrective feedback.
8. Child 's expressions of self-worth.
9. Child task persistence.
10. Negative (positive) behavior: adults to children

11. Negative (positive) behavior: children to adults.

12. Teacher responds to child's question with punishment.

13. Teacher responds to child's question with open-ended question.

14. Child expressions of happiness (unhappiness).

15. Child self-instruction.

16. Child instructing other children.

17. Child interacts with machine or animal.

Teacher discipline of students consists of instances in which the teacher attempts to alter students' conduct or deportment in class. This is coded through the FMO as the teacher giving a child corrective feedback about his/her behavior. The degree of disciplinary action in a classroom is the ratio of instances of observed discipline to the total number of teacher-child interactions observed.

c. Norm-Referenced Achievement Tests for Reading and Math

The research design and the students participating in the present study set specific constraints in selecting the tests for the assessment of student achievement. These constraints have been operationalized into exact criteria which were employed in the selection of a single instrument from the many more or less appropriate instruments available. The evaluation criteria imposed upon the tests are briefly described below.

- The Tests Should be Norm-Referenced

  In addition to the practical advantage that norm-referenced tests provide scaled scores that are more interpretable than raw scores, norm-referenced tests were decided upon as their achievement content covers a wide range of content in an impartial manner. Criterion-referenced tests, being specifically focused upon minute behaviors, are far more likely to be partial in their ability to evaluate effects of individualized or standardized instruction. The impartiality of a published norm-referenced test, in addition to its general acceptability and credibility, argued for the exclusion of special criterion-referenced instruments.

- The Tests Should Measure Common Content of Both Reading and Mathematics Achievement

  The test should have at least two subscales so that scores on reading and mathematics can be separately obtained. Further, common content of the two subscales should be assured. Availability of alternate forms of tests is highly desirable.

- The Tests Should be Independent of Any Specific Curriculum

  In order to fairly assess student achievements for this project, the test instruments must in no way be designed for or associated with any specific curriculum or instructional materials or methods.

- The Tests Should Have Norms that Represent Disadvantaged Students

  Tests with local or incidental norms, as well as tests with national norms that underrepresent students who are educationally disadvantaged are not appropriate. Such tests might well yield normed findings that will, aside from comparisons, mislead the reader of the project's report, and incorrectly influence the decisions that will be based upon the report.

- The Tests Should be Machine Scorable

  Machine scorability is necessary for a project of this magnitude. Present-day tests can be made machine scorable while still maintaining appropriateness for third-grade students.

- The Tests Should Provide Easily Interpretable Scores

  The tests should provide either percentile or grade-equivalent conversions, so that the scores are readily interpretable to the reader of the project report. Uncommon or unique conversion scales are unacceptable for the evaluation instruments.

- The Tests Should Provide Empirical Fall and Spring Norms

  Recent studies have cast a great deal of suspicion on the accuracy of normed scores that have been developed from tests that have been administered at one time of the school year, and have then been projected linearly to other times of the school year. Particularly when the project design will compare fall to spring scores to assess achievement growth, a far more precise and less ambiguous set of findings will be obtainable from tests that have been empirically normed at both fall and spring.

- The Tests Should Not be Unduly Difficult

  Most test publishers provide grade ranges for optimal appropriateness of tests. With disadvantaged students, however, the recommended grade ranges should be treated as upper limits, and, if possible, test levels should be selected that assure an adequate floor for the test scores. A test that is simpler, having an adequate floor, will provide greater variability and accuracy of measurement, thus sharpening the findings of the project.

The eight evaluative criteria listed above were imposed upon the most recent list of available published tests. This list, along with critical evaluations of each of the tests and subscales appears in the CSE Elementary School Test Evaluations (Hoepfner, R., et. al., 1975) and encompasses over 8,300 currently available tests appropriate for elementary school students. This compendium of tests categorizes all tests by the curricular area assessed by the test. The first step in implementation of the evaluative criteria was, therefore, to select the curricular categories appropriate for assessment in this project.

(1) Reading Curricular Areas

The most common curricular objectives for reading instruction at the third grade are undoubtedly related to word recognition and reading comprehension. These goals were readily translated into the following two curricular goals from the CSE Elementary School Test Evaluations:

- Recognition of Word Meanings

  Shows understanding of the meanings of written words, illustrations, synonyms, or antonyms. Shows different meanings that the same word may communicate.

- Reading Comprehension

  Understands material read. Infers the meaning of words from context. Follows written directions. Identifies topic sentences, main ideas, and intentions of the author, and finds supporting details and illustrations in the text. Keeps track of temporal sequences, spatial order, and other relationships. Reads at a rate appropriate to the material and purpose.

(2) Mathematics Curricular Areas

Third-grade instruction in mathematics is still undergoing change throughout the nation, so that selection of one or two specific curricular areas that are very commonly addressed in

instruction is more difficult. In the service of impartiality to differences in individualized versus standardized instruction, however, the test should assess both concepts and computation. These two general curricular goals can be translated into the following goals of the CSE Elementary School Test Evaluations.

- Understanding Math Concepts

  Understands numbers and fractions. Differentiates between numerals, prime and composite numbers. Identifies factors, multiples, and relative primes of a given number. Understands set membership, set relations, set correspondence, and operations with sets. Relates set notation and diagrams to categorical statements in English. Reads, recites, and writes numbers. Understands place values, the rounding of numbers, the decimal system of numeration, numeration with bases other than ten, and Roman numerals. Understands the commutative, associative, and distributive properties, inverse operations, properties of 0 and 1, negatives, and reciprocals. Understands number line diagrams. Finds and evaluates simple numerical rules based on observation. Understands number relationships, number sentences, variables, and formulas. Reads sentences using letters or frames and equality or inequality signs, and relates them to quantitative statements in English. Solves or graphs equations and inequalities. Tests relations for reflexivity, symmetry, and transitivity.

- Whole Number Computation

  Adds, subtracts, and multiplies integers, checks answers.

The eight evaluative criteria were successfully imposed upon the tests that were categorized into the curricular goal areas listed above. Imposition of the criteria quickly reduced the number of qualifying tests from several hundred to two achievement batteries. The two batteries were the Metropolitan Achievement Tests and the Stanford Achievement

Tests. In order to resolve the competition between the two batteries, the test items were inspected and were judged for general appropriateness for disadvantaged students. On this basis the following were selected for the assessment of achievement growth in the project:

- Reading Test

  Metropolitan Achievement Test, Primary 1 (designed for grades 1.5 - 2.4 but provides norms for grades 1.0 - 4.7).

  Word Knowledge (subtest)

  Reading (subtest)

- Mathematics Test

  Metropolitan Achievement Test, Primary 1 (designed for grades 1.5 - 2.4, but provides norms for grades 1.0 - 4.7).

  Mathematics Concepts (subtest)

  Mathematics Computation (subtest)

d. Measures of Student Affect

The criteria to be employed in the selection of measures of student affective outcome are considerably different from those employed for the selection of achievement outcomes. In general, affective measures, if they are published at all, are not nearly as well normed and standardized as most of the achievement tests, and therefore their evaluative criteria must be relaxed in terms of the statistical and psychometric qualities associated with outcome measures. Nonetheless, this project does impose some necessary and desirable qualities upon which student affective outcome measures should be selected. These evaluative criterias are described below.

- The Students Should Respond on the Measure

  Although many of student affective measures are based upon teacher ratings of the students as reflections of student levels of affect, this project also will assess teacher affect, and any teacher affect would logically confound their ratings of students. For this reason, a prime consideration in the selection of the measure is that the students themselves respond to the measure.

- The Measure Should be Well Described

  Because there is much less concensus regarding the goals of affective outcomes in students, it is most important that the test be clearly described in terms of the behaviors it is intended to measure or the theory in which it is rooted. Justification of item selection or development and matches to a logical organization of affective behaviors is desirable.

- The Items Should be Appropriate to Third-Grade Students

  The affective items should be drawn so that third-grade students have no trouble either reading them or understanding what their intent is. Items should not deliberately appear to be measures of something else by being disguised. Items should not be included that are likely to be appropriate to only a fraction of the students. It would be desirable that the instrument forthrightly let the students know what the test measures and how they can most accurately respond to it.

- The Tests Should be Independent of Any Specific Curriculum

  In order to assess fairly student achievements for this project, the affective measures must not be designed for or associated with any specific curriculum or instructional materials or methods.

- The Tests Should be Easily Scorable

  Although machine scorable tests would be most desirable, it may not be likely that such tests will exist. In that event, tests that are easily and objectively scored are preferable to any that are difficult or subjectively scored.

- The Test Should be Published or Previously Employed

  New instruments are all too frequently constructed for each new evaluation or research study. For this project, the literature of student affective measures should be searched in order to find the most appropriate measures for the project needs that either are published and standardized or that have been employed with some degree of success in previous studies. Such tests have an edge in terms of having some validity established for them.

Published and unpublished instruments for measuring student affect were reviewed on the basis of the six necessary criteria listed above. In addition, the tests were inspected for evidence that they had desired psychometric qualities and the items were inspected for such characteristics as relevance to third-grade students, difficulty for item syntax and construction, susceptibility to response bias or "looking good", and focus upon the characteristics under consideration. Based upon this critical examination, the following instruments were selected for each of the student affective outcomes:

(1) Attitudes Toward Subject Matter

The scale "About the Things We Learn" of the School Attitude Survey (Arden Press, 1970) was selected as providing a wide range of opportunities for students to reveal their attitudes towards their school subjects. Fourteen items assess attitudes toward school work in general, grades, homework, reading, language arts, arithmetic, physical education, and attendance. Each of the 14 items is composed of a three-point rating scale, and each point on the scale is described by an attitude statement that is meaningful to third-grade students.

(2) Attitudes Toward School

The scale "About Me and My Classroom" of the School Attitude Survey was selected as providing a wide range of opportunities for students to reveal their generalized attitudes toward school. This scale differs from many of the more general school-attitude scales because it focuses upon the child's immediate school experience --- the classroom. Complaints about the classroom are what translate, at least at the early grade levels, into attitudes to school in general. The nine items of this scale assess attitudes toward seating arrangements, visibility, noise, and being tired or hungry, and are formatted as three-point rating scales, each point described by a meaningful attitude statement.

(3) Attitudes Toward Peers

The scale "About Other Children and Me" of the School Attitude Survey was selected as providing a wide range of opportunities for students to reveal their generalized attitudes about their classmates The eight items of the scale assess attitudes towards other children as bothering one, as friends, as other's feeling to one, about being a leader, about sharing, and about communicating problems and feelings This wide range of social interaction attitudes should provide a comprehensive assessment of attitudes toward peers for this project. The items are formatted similarly to those of the other scales.

(4) Attitudes Toward Staff

The scale "About the Teacher and Me" of the School Attitude Survey was selected as providing a focus of attitudes particularly to the primary staff toward which young children have important relationships -- their teachers. Previous studies have indicated little or no differences in attitudes toward more distant school staff such as principals or school nurses, while many studies point to the value of the student-teacher attitudes. The five items, in a three-point descriptive rating scale, assess attitudes such as the teacher's perceived helpfulness, the teacher's desire to call on one for answers, and characteristics that bother one.

An important reason for the selection of the four scales of the School Attitude Survey, in addition to its relatively high quality in terms of the evaluative criteria enumerated above, was the fact that all four scales are combined into one easily administered survey. Selection of the survey will clearly minimize logistic problems in the testing of the students in this project.

(5) Attitude Toward Self

The total score of the Piers-Harris Children's Self Concept Scale was selected as the measure of this student affective outcome. The scale has 80 items that are answered as yes or no and all items are syntactically and verbally simple. The tests' major advantage is that, unlike many other self-concept measures, its items have no complex sentence structures, such as dependent clauses or subjunctive cases. The instrument has been used extensively, and in many cases very successfully in research studies. Factor analyses of the items have indicated the existence of factors called "behavior", "intellectual and school status", "physical appearance and attributes", "anxiety", "popularity", and "happiness and satisfaction."

(6) Student Locus of Control

CRI feels that a child's sense of control over various aspects of his own education is an important outcome and one that should be assessed. Since, no published measure of locus of control that met the desired criteria for test selection was found in the literature search, CRI has substantially modified an extant instrument such that it meets most of these criteria. The Student Locus of Control Instrument (Contemporary Research, Inc., 1973) was selected. This instrument was developed under contract to USOE, 1973, for the Evaluation of School-Based Right-to-Read Sites. Although the instrument was not actually used at that time, the instrument was pre-tested and validated.

The Intellectual Achievement Responsibility Scale (IAR) (Crandall, Katkovsky and Crandall, 1965) provided the pool of items from which CRI drew 18 items in the instrument. The IAR is designed for administration to students in grades 3 to 12.

CRI found that some of the original items were inappropriate for third graders because of their abstractness or complexity and these were eliminated. The remaining items were simplified where necessary and adjusted for a balance of success related items and failure related items.

The resultant instrument can be administered verbally to individuals or groups of children. Each item describes a school related event and the child is asked to choose one of two explanations for the event. Of the alternative explanations, one attributes cause to some external source such as the teacher behavior or difficulty of a test. The other choice attributes responsibility to an internal source such as the child's ability or how hard he tries.

e. Measures of Teacher Affect

Historically, there has been less systematic inquiry into teacher affective outcomes that student affective outcomes and certainly less than the attention devoted to student achievement outcomes. Therefore, the criteria employed in the selection of affective outcome measures for teachers must necessarily be even less rigorous than those applied to student measures. CRI recognized that it was unlikely that any published instruments which could be considered well normalized or standardized were available for this project. With this in mind, the qualities CRI looked for in the instruments or items selected are described below:

- The Teachers Should Respond to the Measure

  Responses should be first-person and not observations or ratings by principals or supervisors.

- The Measures Should be Well Described

  The measures should, if at all possible, have been employed in other research or evaluations and have been developed with a specific theory or conceptualization of teacher behaviors clearly documented. The items should be justified in terms of well documented objectives.

- The Measures Should be Independent of Individualized or Standardized Instructional Experiences

  In order to fairly measure teacher differences as results or concomitants of variations in instructional methods, the measures should not be based upon or focused upon one of the measures to the partial exclusion of the other. It would be most desirable for the instrument to have been developed without the specific instructional variations in this project in mind.

- The Measures Should be Easily Scorable

  Measures that have any degree of projection or subjectivity in their scoring will not be considered. Not only are such instruments too cost-ineffective for such a study such as this one, but any conclusions drawn from its scores are too subject to debate.

- The Measures Should be Published or Previously Employed

  Tests with some previous history causing it to have accrued some validity evidence will be preferred over the development of wholly new instruments.

Published and unpublished instruments for measuring teacher affect were reviewed on the basis of the five necessary criteria listed above. In addition, the instruments were inspected for evidence that they had desired psychometric qualities and that the items would not insult or invade the privacy of the teachers who would be asked to respond to them. Based upon this critical examination, the following instruments were selected for each of the teacher affective outcomes.

(1) Attitudes Toward Students

The Minnesota Teacher Attitude Inventory was selected as the measure for this affective teacher outcome. The instrument assesses the teacher's capacity for interpersonal relationships with his/her students, a high score indicating a progressive, pupil-centered, non-authoritarian orientation or attitude toward students. The inventory

contains 150 items with a five-point agree-disagree response scale. Items are of the following types:

"Young people are difficult to understand these days."

"Teachers should not expect pupils to like them."

The inventory has been based upon theory of teacher behavior and has been validated in several studies of teacher effectiveness.

(2) Attitudes Toward Colleagues, Job and School

This set of attitudes can easily be translated into an assessment of teacher morale and so the instrument selected was the Purdue Teacher Opinionnaire, designed to assess levels of teachers' morale. This instrument provides a total score reflecting the general level of teacher morale. In addition, it provides sub-scores for the important categories of teacher rapport with principal, satisfaction with teaching, rapport among teachers, teacher salary, teacher load, curriculum issues, teacher status, community support of education, school facilities and services and community pressures. This instrument has been used extensively in both research and evaluations.

(3) Locus of Control Inventory for Teachers.

This instrument is derived from a similar measure which was originally developed and validated for CRI's study of Right-to-Read (CRI, 1973). It consists of a series of factors which could be used to explain student success or failure in reading or in math. For half the statements, the teacher is asked to indicate how strongly she believes each factor is related to student success. For the other half of the items, the teacher is asked to indicate how strongly each factor seems to be related to student failure. For comparison purposes, the lists have certain items in common. Each statement provides a factor underlying student performance which is either internal or external to the teacher. The internal items include such general factors as teacher clarity, teacher concern and teacher

ability. The external items include mostly student factors such as student effort, student motivation and aptitude. Within each list, half the items are internal to the teacher and half are external.

In this study we are interested in variables which are very specific to the classroom and even the particular subject matter. When teachers of reading fill out this instrument they will be asked to explain student performance in reading while math teachers will be asked to reference the various items to their experience in teaching math. This is part of CRI's overall effort to anchor data in the everyday occurrences of the classroom.

The Locus of Control Inventory for Teachers can be analyzed for internallity and externallity main effects and for the interaction between these effects and success and failure. Contrary to one of the criteria used for selection of other measures of teacher affect, this inventory contains several items which were written specifically to reflect our conceptualization of individualized instruction. For example, teachers will be given factors such as student self-pacing and be asked to indicate how strongly related these are to student success or failure.

f. Teacher Interview I.

This teacher interview schedule which is to be administered at the onset of the field portion of the study serves two purposes. First it gathers information on the frequency and manner in which the teacher diagnosed student needs. This includes the procedures used, the materials such as tests employed and the way in which the teacher uses this diagnostic information for prescription of instruction. Second, it collects context and general progress information. Examples of this are presence of other adults in the classroom class size, use of peer or cross-age tutoring, use of special labs and dominant language of students.

In conjunction with administration of the Teacher Interview I, the Project staff Member should give the teacher a thorough orientation to the purpose and use of the Student Activity Log Kit.

g. Teacher Interview II.

This interview takes place at the end of the field portion of the study and is intended to assess process, context and some outcome information that would not have been available earlier. The teacher is asked for information relevant to her/his time spent on various tasks, scheduled time away from class for instructional planning, any inservice training concerning individualization, length of time program has been in operation, and student attendance patterns. Other data is obtained about parent and community involvement as well as teacher participation in school decisions.

As part of Teacher interview II, teachers should be debriefed on their use of the Log. Inquiry should be made as to the basis for differences, if any, in rate, sequence, content of objectives, materials, physical and social setting, teacher behavior and student activity that are indicated on the Log. This part of the interview is important for an understanding of the relationship between diagnosis, prescription and implementation of instruction as it occurred in a particular classroom program. Additional information on analysis of the Log and Teacher Interview II is included in Appendix G.

At the end of the interview teachers should be asked to appriase the Log. This should help assess what effect, if any, using the Log during the period of the study had on classroom process.

h Principal Questionnaire.

Principals of all schools involved in the study should be given a short questionnaire to obtain information on the school and community that is not generally available through teachers. Such information as expenditure per pupil, criteria for assigning students to different classes, staff involvement in school decisions, parent involvement in policy decisions, and certain school characteristics should be assessed.

3. Instrument Pre-testing

Each instrument developed for and/or being used for the first time in this study will undergo a pre-test to determine the clarity of individual items, the interpretation and meanings that various respondents may assign to items, and any other problems that may be encountered during data collection. As a rule, instrument pre-testing should not be done with any of the study sample but rather on a comparable and preferably local sample which reflects the target population. Since instruments will have to be ready for use at the beginning of the normal school year, pre-testing will have to be done with summer session third grade level classes. This may represent a slightly different population from the one used for the study but the differences should not be so great as to be problematic. In accordance with OMB instrument clearance requirements, the number of respondents for the pre-tests should be nine.

4. OMB Package

All of the instruments for this study which are discussed above along with justification for their use, justification for any newly created items or revised instruments and all pertinent instrument administration information should be compiled into a report for submission to the Office of Management and Budget (OMB) for approval. OMB specifications for this package should be adhered to.

F. DATA COLLECTION

1. Overview

This data collection procedure has been developed with the intent of devising a plan that would ensure high validity and reliability, that would keep project costs within an allowable range and that would minimize the inconvenience for students and school personnel.

On-site data collection is to take place during four major data collection periods, covering six months. During this time, data are to be collected from classroom teachers, aides, reading and math specialists, principals and students. Data should be systematically collected through the use of the instruments which were designated in the previous section on measurement.

An essential element of this data collection plan is the availability and use of highly skilled data collection personnel. Therefore, staff training should be given high priority. It is also important that the same personnel be assigned to visit the same schools throughout the study.

2. Data Collection Plan

The essential components of the data collection plan are included in Exhibit III-5: Data Collection Plan, which indicates for each of the study instruments, the method of data collection to be employed, the respondents for the instrument, the time period of data collection and the length of time required for administration.

The total time period for data collection is approximately 6 months. This time is broken down into four major periods as follows:

D.C. 1: Data Collection Pretest - Oct. 4 - Oct. 29, 1976

D.C. 2: Intervening Data Collection - Nov. 15 - Dec. 17, 1976

D.C. 3: Intervening Data Collection - Jan. 1 - Feb. 4, 1977

D.C. 4: Data Collection Posttest - Feb. 21 - Mar. 18, 1977

Exhibit III-5. Data Collection Plan

Instrument	Method of Data Collection	Types of Respondent and Approximate N	Data Collection Time Period	Approximate Length of Time Required for Data Collection
Principal Questionnaire	Self-administered questionnaire	250 Principals	D. C. 1-Pretest	1/2 hour
Teacher Interview I	In-depth interview	250 Teachers	D. C. 1-Pretest D. C. 4-Posttest	2 hours 2 hours
Teacher Interview II	In-depth interview	250 Teachers	D. C. 4- Posttest	2 hours
Metropolitan Achievement Test: Primary I Reading and Math	Group administered, norm referenced test	4000-6000 3rd grade students	D. C. 1-Pretest D. C. 4-Posttest	3 hours 3 hours
• School Attitude Survey • Piers-Harris Self Concept Scale • Student Locus of Control	Group self-administered questionnaires (orally guided)	4000-6000 3rd grade students	D. C. 1-Pretest D. C. 4-Posttest	3 hours 3 hours
• Minnesota Teacher Attitude Inventory • Purdue Teacher Opinionnaire • Locus of Control Inventory for Teachers	Self-administered questionnaires	250 + Teachers and approximately 100 other instructional staff	D. C. 1-Pretest D. C. 4-Posttest	3 hours 3 hours
Classroom Observation Instrument (3 parts: PEI, CCL & FMO)	Classroom observation	250,3rd grade classrooms	D. C. 2 D. C. 3	2 days 2 days
Student Activity Log	Teacher kept records	250 Teachers	Total data collection time period	6 months

a. Data Collection Pretest (D.C. 1)

The first major data collection period is scheduled for Oct. 14 through Nov. 1, 1976. (Data collected during this period should be treated as pretest data). During this period, 25 data collection personnel are to visit approximately 10 schools each for 2 days per school. As shown in Exhibit III-5, while on-site, they are to 1) interview the school principal and the master teacher of the classroom under study; 2) administer the achievement test to the 3rd grade students; 3) administer all non-cognitive instruments to students and teachers and other instructional staff; and 4) instruct the teacher on the use of the Student Activity Log.

Whenever feasible, those sections of the interview questionnaires that can be completed by the principals and teachers prior to the staff visit should be mailed in advance of the visit. Also, to maximize the use of test administration time, the teacher non-cognitive instruments should be administered at the same time the students are taking the Metropolitan Achievement Test.

b. Intervening Data Collection (D.C. 2 & D.C. 3)

There should be two intervening periods of data collection, the first of which is scheduled for Nov. 15 - Dec. 17, 1976, and the second of which is scheduled for Jan. 1 - Feb. 4, 1977. Classroom observation, using the Classroom Observation Instrument, comprises the primary method of data collection during this period. Observational periods in each classroom should cover two days, and when feasible, the teacher should not be notified of the exact day that the observer will arrive. For practical reasons, however, they should be told the week (but not the day) that observation will take place.

c. Data Collection Posttest (D.C. 4)

The last major data collection period is scheduled for Feb. 21 - Mar. 18, 1977. This data collection period should be treated as a posttest; therefore, all of the same instruments (but where

available, different forms) are to be administered to the same respondents who took the pretest. Data collection should take approximately 2 days at each school and same procedures for instrument administration that were employed during D. C. 1 should be employed during D. C. 4.

d. Student Activity Log Data Collection

One study instrument, the Student Activity Log, is to be used throughout the entire six months of data collection. As described in the measurement section of this report, all of the teachers in the sample are to keep detailed records on the progress each student in the class has made on a predetermined set of objectives in the Student Activity Log.

During the D. C. 1 period, the data collection personnel is to thoroughly explain to the teacher the log and its use. The data collection personnel should make it clear to the teachers that the log records are to be updated whenever there is new information to enter. They should be warned against letting a long period of time elapse and then trying to recall the data. The duplicate copy of each weeks' update of the log is to be mailed to the contractor on the Friday of each week; however, during each of the three data collection periods (D. C. 2, 3 and 4), the data collection staff member should review the log for its accuracy and completeness and any problems that the teacher might be having should be discussed. If the contractor has not received the weekly update of the log by Tuesday of each week, telephone follow-up should be conducted.

At the end of the entire data collection period, March 18, all teachers are to mail a copy of the completed log to the contractor. If the log has not been received within a reasonable period of time, the teacher should be telephoned and reminded of the urgency of returning the log immediately.

3. Selection and Training of Research Staff

Data collection personnel will be needed to conduct interviews, to do systematic classroom observations, to administer

standardized achievement tests, and to distribute and collect self-administered questionnaires. Also, field supervisors are needed to train the field staff and to control the quality of data collection. The intent in selecting and training the data collection staff is to increase the reliability and validity of the data collected, but also to foster positive relations with the schools and communities involved in the study.

a. Staff Selection

Approximately 25 staff members will be needed for data collection; however, it is anticipated that not all individuals selected will qualify or will always be available. Therefore, substitute interviewers will be needed. About 20% more persons should be initially selected and trained even though they may not actually be needed in the field.

Members of the data collection staff participating in on-site visits should be capable of 1) rapidly learning the appropriate procedures for collecting data; 2) dealing with the data collection process in an objective and confidential manner, and 3) relating well with members of the local school-community, especially administrators, teachers and students.

Although good public relations could be realized by selecting members of the research staff from local community, given the number of different schools and districts in and the geographical spread of the sample, it is not practically feasible to use local community personnel.

The composition of the entire data collection team should be multi-ethnic and somewhat proportioned to the ethnic/cultural make-up of the respondents in the sample. However, it is not desirable that the assignment of the data collection personnel to schools be done on the basis of ethnicity alone. The prime criteria for assignment ought to be based on a desire to maximize good relations with the school personnel and on the desire to decrease travel costs.

Another reason we suggest that the contractor not attempt to directly ethnically match the data collection staff to the school staff and students is because it is unrealistic to suppose or even attempt to perpetuate the notion that Blacks should work with Blacks, Whites should work with Whites, Chicanos should work with Chicanos, etc. On the other hand, the input of various ethnic groups into the total process is an essential element toward ensuring inclusion of the concerns of each of the ethnic/cultural groups involved.

Teachers, aides, etc., should not be given the task of administering the achievement tests because they should be completing the teacher non-cognitive instruments during the student testing periods, and most importantly, because orienting teachers about the test may bias the results by enabling teachers to "teach for the test."

b. Data Collection Staff Training

Regardless of prior experience, it is essential that all data collection personnel undergo extensive staff training.

(1) Purposes

The purposes of the training are as follows:

- To familiarize the personnel with the content of all of the study instruments that are to be administered.
- To train the staff in the specific procedures for administering each instrument.
- To afford the staff practice in administering the instrument and anticipating and answering typical questions of respondents.
- To identify the strengths and weakness of the data collection team so that none of the members nor individuals involved are put in situations they cannot handle.

- To allow the staff to identify and understand their own biases so that they will not impose them on the individuals and schools they may encounter.
- To familiarize the staff with the conceptual framework of the study design and the definition of individualized vs. standardized instruction.
- To familiarize the staff with the travel and other logistical procedures they must follow.

(2) Training Schedule

Staff training sessions should be scheduled such that they directly precede the data collection period and should cover a sufficient length of time to ensure the accomplishment of all of the above purposes. Because of the restricted time schedule to complete the entire study, all personnel should be trained at the same time so that training sessions need not be repeated. Each training session should cover the instruments and procedures to be used in the data collection period that follows. Since the D.C. 3 and D.C. 4 data collection periods essentially use the same procedures as the D.C. 1 and D.C. 2 periods respectively, the training periods preceeding D.C. 3 and D.C. 4 should be used to review old procedures, changes in procedures and new procedures, and to re-check inter-rater reliability especially on the SRI Observation instrument.

The schedule of the training periods is as follows

Sept. 20 - Oct. 1 (2 weeks)	-	Training for the pretest data collection period; D.C. 1.
Nov. 1 - 12 (2 weeks)	-	Training for the intervening data collection period, D.C. 2 (classroom observation training).
Jan. 3 - 7 (1 week)	-	Training for the intervening data collection period; D.C. 3 (classroom observation review).
Feb. 14 - 18 (1 week)	-	Training for the posttest data collection period; D.C. 4.

(3) Training Program Content and Techniques

With the exception of classroom observation training, all staff training should be conducted by in-house senior personnel. Classroom observation training is to be conducted by Stanford Research Institute (SRI), the developers of the Classroom Observation Instruments, as it is a very complex instrument to use. This training takes at least 5-10 days of intensive study. On two occasions in the past, CRI has arranged for training of its own staff on the SRI instrument and has found the SRI staff to be flexible, amenable and capable of meeting the specific needs of the staff to be trained. SRI will conduct the training at the contractor's facilities, using video-taped and real classroom situations. The SRI training also includes procedures which check inter-rater reliability.

Training on all other instruments should be designed and conducted by an in-house trainer. The training, in general, should first focus on the general techniques of unbiased interviewing, test administration and classroom observation, followed by the specific procedures associated with each instrument and test. Whenever appropriate audio-visual materials should be used such as overhead projections of the instrument items and/or instructions and tape recordings from the instrument pretest sessions.

All participants should be given an opportunity to administer the instruments to each other and participate in role playing experiences. A list of anticipated respondent questions should be developed and the answers discussed.

Each participant should be given a training manual which includes the following:

- Copies of all the study instruments
- Instruction for administering each instrument
- The instrument administration schedule

- Instructions for handling the data (e.g. where to mail data, how to package it, and how to edit it for obvious errors)
- A list of anticipated respondent questions and answers
- Logistical information such as travel arrangements, expense vouchers, etc.
- List of names and personnel to contacted at each school and numbers of respondents to be sampled
- Emergency procedures for contacting the project's principal staff.

4. Procedures for Ensuring Respondent Cooperation

As in any study of this nature, the quality of the data in many ways is dependent on the cooperation of the respondents. On the other hand, uncooperativeness of respondents can become a major obstacle. In order to help ensure the cooperation of the schools and respondents, CRI has developed the following procedures:

a. Follow the Lines of Authority for Gaining Entree into the District

The routinely accepted procedures for gaining entree into the district should be followed. Specifically, letters explaining the project should be sent to the district superintendent with a copy to the compensatory education director. Following approval at that level, the school principal should be contacted by mail and his cooperation sought. Only after district and school level permission have been granted, should teachers be contacted. Teachers should be contacted first by mail and then arrangements made for telephone contact at a time that does not interfere with the teachers' teaching schedule.

b. Fully Explain the Study Requirements to Participants

At each level of inquiry into the district, the study's requirements should be fully explained. It is more likely that participants will cooperate if they know from the beginning what is expected of them.

c. Pay Teachers an Honorarium for Their Participation in the Study

An honorarium should be provided to teachers as an added inducement for participating in the study. CRI suggests that the honorarium be set at $100 and that all teachers be paid the same amount. If the study team, however, finds that the honorarium does not motivate most teachers because it is not enough, they should consider raising the amount of honorarium.

d. Provide the School with Their Students' Test Results on the Achievement and Non-Cognitive Tests

Student test results are often very useful to the teacher and the school; therefore, the study team should offer to provide them to the school. Non-cognitive test results may be most desired as it has been CRI's experience that such information is usually difficult for teachers to obtain.

e. Stress the Side Benefits for the Classroom Teacher in Keeping the Student Activity Log

The side benefits of keeping the Student Activity Log is that the teacher will have an easily manageable system of tracking and recording the progress of the students within the class (at least on the objectives that are included). This may be an additional aid to teachers who have found this to be a difficult task.

f. Provide the School with a Copy of the Final Report

Since the final report will include information that will be extremely helpful to schools, each school in the sample should be provided a copy of the final report.

g. Ensure the Participants of Confidentiality

Procedures to ensure confidentiality of participants and their responses should be strictly enforced. Participants should be made aware of the fact that no names of schools or participants will be mentioned in the report.

5. Quality Control of the Data Collection Effort

Since the quality of the data will have tremendous impact on the results of the study, the study team should implement procedures that will increase the quality of the data collection effort. CRI suggests the following procedures:

a. The Deputy Project Manager Should Directly Supervise the Data Collection

This individual should have prior experience in supervising data collection for similar large scale efforts. Early in the study, this individual along with the Project Manager should work out the specific details of the data collection plan and delineate the roles and responsibilities of assisting personnel.

b. Field Personnel Should Review all Questionnaires

Field personnel should check all instruments for errors and completeness prior to leaving the school. The instruments should again be checked as they are returned to the contractor's office.

c. Field Personnel Supervisors Should Monitor the Data Collection Effort and Check Inter-Rater Reliability

Field Personnel Supervisors should be designated to directly monitor personnel in the field. These persons, working under the direction of the Deputy Project Manager, should travel from school to school and monitor the efforts of the field personnel. These individuals should discuss with school personnel any problems related to data collection.

Due to the complexity of the SRI Observation Instrument, one of the prime responsibilities of the field supervisors is to monitor inter-rater reliability. In total the field supervisors should make no less than three inter-rater reliability checks on each observer (one during the pre-staff training, one during the actual on-site D.C. 2 or D.C. 3 periods, and one during the staff retraining and review period).

Procedurally, on-site inter-rater reliability checks will be done by the field supervisor and classroom observer observing and recording the same phenomena. If agreement between the two raters is less than a .82 correlation, the field supervisor is to determine and implement appropriate corrective and/or retraining measures.

G. DATA ANALYSIS

The overall plan for data analysis follows the three-stage outline of the research design described earlier. At each stage the statistical procedures employed are designed to provide answers to the research questions posed for that stage. Thus, we have organized this section around the stages.

1. Stage 1 - Defining Treatments

The major task posed during this stage is to provide an accurate summary description of existing programs with respect to the eight dimensions of individualization of instruction, and to develop a typology of these programs.

Data analysis for Stage 1 should begin quite early in the research effort, and should form part of the basis for selection of the final sample for intensive study. The sampling procedure involves the collection of data from 400 teachers by means of a structured telephone screening procedure. This procedure should yield enough information about each classroom to provide a basis for scoring each classroom on each of the eight dimensions of individualization/standardization for both reading and math. The scoring system should involve no more than four scores (ranging from "highly individualized" to "highly standardized") for each category. The scores would be assigned by the interviewer. To ensure

that the reliability of scoring is adequate, it is suggested that a subset of the interviews be scored independently by two interviewers. This procedure will yield an array of sixteen "individualization" scores for each classroom in the sample, corresponding to the eight dimensions for reading and math. These arrays constitute the raw data for the major part of the first stage of the analysis.

In addition, descriptive summary statistics on the major contextual and input variables would be compiled for each classroom.

From the arrays described above, it is possible to construct two different correlation matrices: (1) a matrix of correlations among dimensions, computed across classrooms; (2) a matrix of correlations among classrooms, computed across dimensions. The matrix of correlations among dimensions would provide a preliminary indication of whether these dimensions are highly intercorrelated or unrelated. To the extent that the eight dimensions are all reflections of a single "individualization" dimension, the correlations will tend to be quite high within a given content area (reading or math). Correlations between each of these dimensions and the background variables should also be computed to determine whether the different types of programs seem to be related to the presence of certain contextual and input variables. To investigate high-order interactions among variables, multi-way contingency table analysis can be employed. The exploratory data analysis approach advocated by Tukey (1975) might also be useful. From such analyses a general picture of the variability among programs will emerge.

On the basis of this exploratory analysis, there should be some indication whether various classroom characteristics are highly intercorrelated or unrelated. However, we are particularly interested in relationships among those process variables which are often thought of as comprising aspects of individualization.

The classical approach to determining whether one (or a few) dimensions seem to underlie a set of separately measured variables is factor analysis. Factor analysis starts with the correlation matrix among the variables and essentially looks for linear combinations of

variables which account for the most variance. The amount of variance accounted for is a reflection of the amount of intercorrelation among the components of the factor. Factor analysis works well when the linear, additive model it assumes is a reasonable approximation to reality. However, we feel that in the present situation it would be more appropriate to employ a technique which makes fewer assumptions, and are, therefore, recommending the use of multi-dimensional scaling.

In general, this technique involves first the definition of a distance metric between two individuals (in this case classrooms) in the space of all relevant variables. Multi-dimensional scaling algorithms then essentially determine whether there exists a sub-space of the entire variable space of only a few dimensions in which the data can be adequately represented. These dimensions need not have any neat mathematical form, as in factor analysis.

In the present case, a distance metric can be defined quite easily from the correlations among classrooms, from the sum of the differences between them, or some other index. The scaling analysis would then seek to arrange these classrooms in a space of eight or fewer dimensions in such a way that the "distances" are maintained. The scaling algorithm provides a "solution" for any given number of dimensions, and a goodness-of-fit index can be calculated for each solution. The goal of the analysis is to provide the best possible fit with the fewest possible dimensions.

Ideally, of course, such analyses will generate one dimension which can be interpreted as the degree of individualization. Classrooms can then be ranked in terms of this dimension. Of particular interest will be whether the classrooms fall along a continuum or into two or more discrete groups.

The purpose of this analysis is to determine whether the existing curricular programs fall into natural groupings which can serve effectively as "treatments" to be compared. If as a result of the analyses described above, a single dominant dimension interpretable as corresponding to individualization emerges, this task will be greatly simplified.

If there does not exist a single dimension, it may be worthwhile to undertake a cluster analysis. Cluster analysis is a generic name for a number of techniques which attempt to divide a sample into subgroups, or clusters, which are themselves relatively homogeneous but which differ from other clusters. In our situation, we would be attempting to find clusters of classrooms such that classes in the same cluster would have similar values on most variables, while those in different clusters would display different patterns of [illegible]

If there are a relatively small number of well-articulated [illegible] gram types, a cluster analysis of process variables should uncover it.

Classrooms should at least initially be scaled separately for reading and math. There are two reasons for this: first, it is likely that some classrooms will "individualize" instruction for only one subject. Second, the patterns or types of individualization that emerge may differ for the two subjects, and the analysis should allow for this possibility.

The results of the analyses during Stage 1 would serve two critical purposes: first, they would form the basis for defining "treatments" in the study; and second, they would aid in final selection of a sample of classrooms which adequately represent different combinations of treatments. Performing this exploratory analysis at an early stage has the additional advantage or providing a general familiarity with at least some of the data and potential problems in handling it. This experience should facilitate the performance of analyses in later stages.

It should be noted that while data from the telephone screening procedure will be used to develop the typology of programs and to select the sample of classrooms, later phases of the data collection procedure will provide additional (and probably more accurate) information on the way in which a given classroom actually operates. Thus, data from the Student Activity Log should be used to verify and revise the initial classification of such classroom with respect to treatment condition. As a result of this additional data, some classrooms may be reclassified.

The strategy suggested for Phase 1 can be illustrated by applying a "seat-of-the-pants" multidimensional scaling analysis to the variables and data shown in Exhibit III-1, which were collected during the Telephone Screening Procedure. The exhibit lists six individualization/standardization variables, and categorizes each of 41 classrooms as individualized (I), standardized (S), or differentiated (D) with respect to each of these variables. If we arbitrarily score S = 0, D = 1, and I = 2, these categories can be considered numerically ordered with respect to the degree of individualization they represent. From this data, it is then possible to compute a numerical index of the "distance" between any given pair of variables or any given pair of classrooms. The distance is simply the sum of the differences between any two variables across classrooms, or any two classrooms across variables. Conceptually, the "distance" between two classrooms represents the extent to which they employ differing instructional practices, across the six dimensions as a whole, and the "distance" between two variables represents the extent to which their pattern of occurrence differs across classrooms.

For purposes of illustration, it is simpler to focus on the relationships among variables than among classrooms, since the data can be displayed more economically. The diagram below shows a matrix whose entries represent the "distances" among the six variables represented in Exhibit III-1, based on the data in that exhibit. The entry in any given cell represents the "distance" between the row variable and the column variable. The smaller the distance, the more similar the two variables are in their pattern of occurrence across classrooms. The numbers given are based on scores for math instruction only, although the data are quite similar for reading.

	Content	Sequence	Rate	Materials	Teacher Behavior	Physical Setting
Content	X	8	15	9	19	19
Sequence	8	X	7	4	15	17
Rate	15	7	X	11	14	22

	Content	Sequence	Rate	Materials	Teacher Behavior	Physical Setting
Materials	9	4	11	X	17	13
Teacher Behavior	19	15	14	17	X	24
Physical Setting	19	17	22	13	24	X

It is readily apparent that the two most similar variables are sequence and materials, while the two most dissimilar are teacher behavior and physical setting. A rough plotting of these variables in two dimensions on the basis of their distances reveals that rate, materials, sequence, and content can be easily represented in two dimensions, whereas a third dimension is needed for teacher behavior and physical setting. Thus one data suggest that teacher behavior and physical setting should not be collapsed into the same variable category with the other four dimensions (or with one another). Of course, the actual decision as to how to define treatment conditions would involve carrying out the above procedure across classrooms rather than variables, but the principles involved are the same. The procedure would yield a "picture" of classrooms, in which those which are similar are clustered together and those which are different are spatially separated. The sampling procedure would involve, in effect, placing a grid over this spatial representation and selecting a sample of classrooms from each area of the grid in which there are found to be classrooms. The size of the grid and the number of areas defined on it would be based on the obtained pattern of classroom variation. In Exhibit III-1, the forty-one classrooms display 19 distinct patterns of individualization. Some patterns are quite similar to one another, and would be lumped together in the process of defining treatments. The goal would be to select a small number of fairly distinct patterns.

2. Stage 2 - Comparing Treatment Effects

During the second stage of the data analysis, we will be in a position to address the main question: What can we say about the

effectiveness of individualized instruction in compensatory education? Specifically, our task is to compare outcomes for children exposed to different types of instructional techniques related to the concept of individualization. This task is complicated, however, by the fact that a host of other variables may also affect outcomes. Thus, if we simply compare mean outcomes for children exposed to "individualized" vs. "standardized" programs, we know that there may still be biases as a result of other differences among the classrooms (and their environments). One suggested strategy for dealing with this problem is the use of multiple regression analysis. For any given outcome variable, multiple regression would specify an optimal set of linear weights for a given combination of treatment, contextual and process variables, accounting for the maximum variance in outcomes. The obtained beta weights for the treatment variables would provide an estimate of the effect of these variables, taking into account the effects of other ("control") variables on outcomes, and intercorrelations among the predictor variables themselves.

One difficulty, however, in applying a multiple regression technique to the data in the present study is that the number of potential independent or "predictor" variables is quite large relative to the number of data points. For this reason, it is necessary to develop a strategy for reducing the number of variables to a manageable set, which will include all of those which are most important.

There are several ways in which this might be accomplished, no one of which is entirely satisfactory. One approach is to use a "step-wise" regression procedure, in which new variables are added to the regression equation one at a time, and the importance of their "contribution" or predictive value is gauged by the extent to which they improve the predictive power of the equation. Unfortunately, step-wise regression can be a highly misleading way of assessing the importance of a variable, since how much predictive value is added depends heavily on the stage at which the variable is introduced.

Another approach would be to screen the large set of contextual and input variables in a preliminary analysis, seeking to identify those which are most important and eliminate others from subsequent analyses. A variable might be eliminated, for example, if it appears to have little

or no relation to the outcome variables by itself, little or no relation to treatment variables, and gives little or no evidence of interacting (on a first-order basis) with treatment variables in affecting outcomes.

A third approach would involve performing a series of multiple regression analyses, each of which includes the treatment variables in a combination with a small subset of other background variables, in varying combinations. Those variables with consistently low beta weights could then be eliminated from further consideration.

Each of the above methods involves certain drawbacks. In the first, however, the primary danger is one of distortion of the real contributions of the variables. In the latter two, the major drawback is that one may inadvertently "lose" important information. However, it is necessary to select from among the many variables those which are most important, and it is, therefore, recommended that variables be screened using a combination of the latter two approaches.

With respect to achievement outcomes, the multiple regression analysis should focus on change or "growth" scores in student achievement, rather than simple post-test outcomes. This recommendation is based on recent findings suggesting that traditional techniques (such as analyzing post-test scores with pre-test scores "covaried") are inadequate in removing bias from quasi-experimental data (cf. Bryk and Weisberg, 1975; Lord, 1967; Campbell and Erlebacher, 1970). While analyses based on change scores are often avoided because of their greater unreliability, this is not likely to be a major problem when the score is based on the classroom as a whole, rather than the individual student. Change scores might also be used to define outcome measures for non-cognitive variables (teacher and student attitudes), and for some measures it might be desirable to analyze both change scores and post-test scores, reporting any differences in the results of the two methods which might affect the conclusions of the study.

In summary, the second stage of analysis would attempt to estimate the impact on outcomes of the treatment variables related to individualized or standardized instruction, taking into account other variables related to outcome or treatment.

3. Stage 3 - Predicting Implementation Effects

In the third stage of the analysis, the contractor should attempt to estimate the likely impact of the implementation of a particular type of program on a hypothetical classroom with a given set of characteristics.

A number of sources of data within the study are relevant to this task. The first of these is the relationship between the occurrence of a given type of program and other school, community, or classroom characteristics. Any systematic relationship between frequency of a program (or "treatment") and other school or classroom characteristics should be examined very carefully to determine whether the relationship is relevant to potential problems in program implementation. For example, if a given type of program tends to occur only in fairly small classrooms, one would want to examine whether there might be a good intrinsic reason for this.

The second part of this task is to examine the effects of the individualization/standardization treatment variables separately for classrooms and students with different characteristics. At the classroom level, the sample size may not permit cross-tabulation of the results using more than one or two background variables at a time. However, each of the variables found to be important at earlier stages of the analysis should be examined with the goal of establishing estimates of treatment effects within different levels of that variable. The results of these analyses should be interpreted carefully, keeping in mind the likelihood of chance variations in means. Confidence estimates should be provided for each of the means or regression weights calculated in this stage. The overall goal should be to assess whether, on the one hand, the treatment variables appear to exert a consistent effect which is substantially independent of other process or background variables; or on the other hand, the effect of the major treatment variables is substantially different in classrooms with different characteristics. The possibility of "cross-over" interactions

(in which treatment variables exert opposite effects under different conditions) should be especially examined, since this form of interaction has substantial policy relevance.

The multiple regression analysis performed in Stage 2 will provide some information relevant to Stage 3 questions. However, multiple regression analysis has certain limitations in its ability to adequately adjust for biases produced by other variables. Thus the analysis should be supplemented by other techniques which approach the data somewhat differently.

One such approach might involve the use of a form of residual analysis, in which one would attempt to construct a mathematical model relating student growth rates (change scores) to classroom characteristics, and then compare the residual or "added-on" effects of the major treatment variables to these baseline effects. The mathematical model itself may be based on a regression analysis, on multidimensional scaling of classrooms with respect to background characteristics, or on one or more other methods.

In view of the important policy questions which underlie the proposed research, it is particularly desirable to address some of the problems related to implementation of the research findings. It is of little value to estimate the impact of hypothetical curricular changes in schools which are likely to be unable or unwilling to make these changes. For example, some communities or schools may have a strong cultural or ideological commitment to certain approaches. Thus, the results of a study on curriculum effects may be quite irrelevant to them, since they could only with great difficulty be persuaded to adopt it.

Moreover, the basis on which a given type of program has been selected may be systematically related to background and contextual variables which are also related to outcomes. Thus, the effects of these variables will be confounded with those of the treatment. The selection process may also interact with the effectiveness of the treatment. For

example, the apparent effectiveness of a program during an evaluation may be related to the fact that it was selected by those who most need or want it. When imposed on less willing participants, the program may prove quite ineffective.

However, there may be a subset of classrooms for which the choice of curriculum is based on factors relatively unrelated to outcomes, and appears susceptible to change. For example, the choice may involve limited knowledge of alternatives or represent a tradition which has been considered very little in recent times. Such a subset would have two major advantages for analysis. First, from the standpoint of external validity, such classrooms may be particularly susceptible to being influenced to alter existing policy in the face of persuasive evidence on program effectiveness. Second, the selection process may have little bearing on program effectiveness, since programs were not chosen on the basis of strong preferences. Thus, we are suggesting that devoting some attention to the process by which curricula are selected may reveal a subset of classes for whom unbiased estimation of treatment effect is both appropriate and useful for public policy purposes.

Unfortunately, the criteria for selection of such a subset are difficult to specify in advance. However, as a part of the analysis at Stage 3, an attempt should be made to identify a subset of classrooms for which program selection appears to be unrelated to background characteristics that might affect outcome, and in which curricular change seems quite feasible.

A decision as to the precise nature of the criteria to be used in selecting this subsample might be based on 1) the correlations between type of program and background characteristics found in Stage 1 of the analysis; 2) information obtained from principals and teachers regarding the range of curricular materials available and the basis for selection, 3) judgements by field personnel based on observation in the various school settings. An attempt would then be made to estimate the probable impact of program changes for these schools.

4. Descriptive Statistics

In addition to the analytic procedures described above, the contractor should provide a full range of descriptive statistics. Descriptive statistics are those methods that are used to summarize the data that has been collected, but which do not involve statistical inference. These methods will include the following:

- Frequency Distributions
- Measures of Central Tendency
- Measures of Variability
- Cross-tabulations

Frequency distributions will show the type and shape of the distributions, and will be used to determine the type of statistics to be used in the analyses of the relationships of variables. The measures of central tendencies will be used to construct profiles of the communities, schools, and of the sample of teachers, students and classrooms who will participate in the study. Measures of variability will include the range and standard deviation and will also be used in the establishment of the profiles. Crosstabs will show the relationship of the variables in the study to one another.

5. Derived Variables

Many of the most interesting and potentially important variables in the study may not be available in the form of direct raw scores. Thus an important part of data analysis is to derive indices and statistical measures that reflect important independent or outcome variables. Potentially, the number of derived variables is literally staggering. However, only a relatively small number have great a priori interest. We will list a few of these here, and indicate how indices might be constructed.

a. Locus of Control

Each item of the Teacher Locus of Control scale is keyed either toward student or teacher attributions for success or

failure. That is, each item ascribes success (failure) to something about the student, or something about the teacher. Derived scores from these scales consist of the following: (1) summed attribution to teacher, which can range from 0 to 24 summed across the eight teacher items, (2) summed attribution to student, which can also range from 0 to 24, (3) net attribution to teacher (student), the difference between (1) and (2). This latter index is of particular interest, since it reflects the teacher's tendency to assign responsibility for success or failure differentially to students or to the teacher. Scoring for specific items is included in Appendix B.

b. Student Activity Log

This instrument provides a wealth of data on the classroom activities of individual students with respect to each of a large set of objectives which have been individually defined for a particular classroom. It provides essentially the same information that would be provided by a criterion-referenced test, with additional information on the instructional techniques associated with attainment of a particular objective. Many of the variables and indices provided by the log will be "derived variables" in the sense that some preliminary data analyses must be performed to provide the scores which are of primary interest. For example, the degree to which rate is individualized can be indexed as follows: first, those objectives which most or all students in the classroom have worked on would be identified. (It is necessary to eliminate objectives not prescribed for most students in the class so that the index will not be confounded with differences in content). For this subset of objectives, the Student Activity Log provides three separate measures which can be used to index rate: the date on which a student begins work on an objective, the date on which a student completes an objective, and the total number of hours spent working on that objective. To the extent that the teacher is employing individualized instruction by varying rates, there should be wide variation in any or all these measures across students, for each objective. Thus individualization of rate can be indexed by

computing the between-student variance for each of these measures for each objective, and averaging across objectives. For starting dates, the analysis would begin by defining the earliest date at which any student began work on a given objective as "Day 1," and would assign a "score" to every other student on the basis of how many days after this date he or she is recorded as having begun work on this objective. To the extent that these starting dates vary across students the teacher is assigning new objectives at an individual or (subgroup) level. A similar procedure could be used to index rate in terms of completion dates, total elapsed time, [(completion date)-(starting date)] and total number of hours elapsed.

Individualization of sequence can be indexed by rank ordering the set of objectives for each student according to when he begins work on the objective. To the extent that the teacher is individualizing the sequence of instructional objectives, these rank orders will differ from one student to another. Thus the average rank-order correlations (Rho), averaged across students and objectives, would serve as a useful index of standardization vs. individualization.

With respect to content, a simple and useful index might be constructed by examining the matrix of students objectives, in which the rows represent students who have been in attendance throughout the entire record-keeping period and the columns represent objectives on which at least some students have worked. To the extent that the teacher "standardizes" the assignment of objectives, this matrix will tend to be "filled" -- that is, each student will be recorded as having spent at least some time on every objective. To the extent that this is not the case, then, it can be said that the teacher is individualizing content. Thus the proportion of cells in the student objective matrix which are filled could be used as a rough index of standardization.

Unfortunately, this index would be distorted to some extent by the direction in which individualization occurred. That is, if a teacher assigned an additional objective to one or two students in the class, the matrix would gain more empty cells than if the teacher failed to

assign an objective to one or two students. Thus a more accurate index not subject to such distortion would be provided by computing an "interaction" score, representing the degree to which cell values in the matrix depart from theoretical values based on row and column totals. (This index would have the additional advantage of controlling for rate differences). The logic is much the same as the logic underlying chi-square, the difference being that the purpose is to derive a meaningful descriptive index of individualization/standardization from the data, rather than to test a hypothesis of contingency.

Much the same approach can be used to derive indices for the other five variables. However, in these cases, the matrices would include columns representing each of the possible categories of, for example, teacher behavior. To the extent that the teacher behaves similarly toward all students working on a given objective, the all values would be completely predictable from row and column totals. Departures from such predictability, then, would index individualization of teacher behavior. These indices would be computed separately for each objective, weighted according to their possible range on that objective, and averaged across objectives to provide an overall index of individualization with respect to each dimension.

6. Data Conversion and Editing

The purpose of this function is to transform the raw data that comes in from the field into machine-readable form and to provide data editing and validity checking to ensure that a verified and accurate data base is established. Instruments should be set up so that key punching can be done with a minimum of manual editing. Statistical quality controls should be used to ensure that the data is transformed properly. In addition to the detection of errors in the data transformation process, the computer should be used to determine which data are missing, which answers are invalid or inconsistent and which skip patterns have not been observed. Data items should be checked for errors, such as out of range, out of field, illegal character, missing values or combinations of data items. Procedures should be established for the correction of errors and the follow-up to acquire missing data and correct errors.

IV. STUDY ADMINISTRATION AND IMPLEMENTATION

A. OVERALL MANAGEMENT AND STAFFING REQUIREMENTS

The management and staffing pattern for the study should make use of a diverse group of individuals who represent many fields of expertise and levels of experience. It is desirable to assemble a staff which is both competent in specific disciplines such as education, psychology and sociology, and sensitive to human interaction in the learning and helping processes. In addition to such divergence of orientation and expertise, the study team should be made up of people from varied ethnic groups in order to foster obtaining differential perspectives from those ethnic groups served by compensatory education programs.

Exhibit IV-1: Management Plan illustrates the lines of authority for project management.

B. STAFF RESPONSIBILITIES AND QUALIFICATIONS

Key staff positions, areas of responsibility and duties are listed below. Project manloading and staffing level information is provided in Exhibit IV-2.

1. Project Technical Director

- Has prime responsibility for the technical direction of the project.
- Approves the methodological procedures related to sampling, data collection, instrumentation and data analysis.
- Reviews and approves all study products and reports (quality control function).
- Interprets data, writes and makes policy recommendations for final report.

Exhibit IV-1. Management Plan

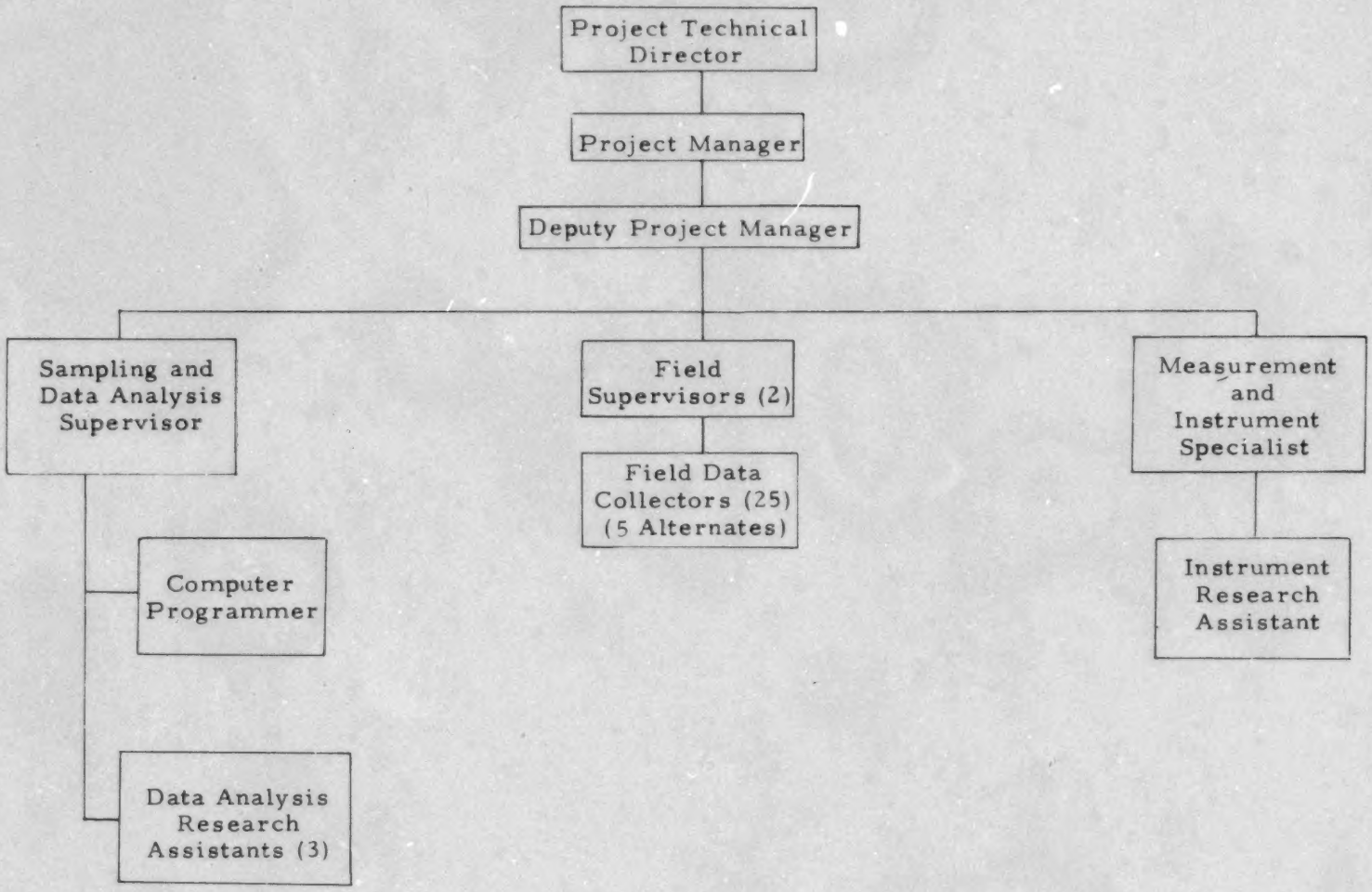


Exhibit IV-2. Project Manloading and Staffing Level

Staff Positions	Staffing Level Category	Man Months to be Committed to Project	Period of Time Working
Project Technical Director	1*	18 m.m.	2/76-7/77
Project Manager	1	18 m.m.	2/76-7/77
Deputy Project Manager	2	18 m.m.	2/76-7/77
Sampling and Data Analysis Supervisor	1	5 m.m. 11 m.m.	2/76-6/76 9/76-7/77
Computer Programer	3	2.5 m.m. 5 m.m.	2/76-6/76 9/76-7/77
Data Analysis Research Assistants (3)	4*	27 m.m. (9 m.m. each)	11/76-7/77
Field Supervisors (2)	3	22 m.m. (11 m.m. each)	4/76-3/77
Field Data Collectors (25) Alternates (5)	3	162.5 m.m. (6.5 m.m. each)	9/76-3/77
Measurement and Instrument Specialist	2	4 m.m.	3/76-6/76
Instrument Research Assistant	3	3 m.m.	3/76-5/76

*1 = Highest level, 4 = Lowest level

- Guides and supervises the development of the final report.
- Serves as prime liason between the contractor and NIE.
- Sets qualifications and approves the hiring of all personnel.
- Provides technical input to monthly reports.

2. Project Manager

- Has prime management responsibilities for project.
- Recruits, hires and fires staff.
- Assigns staff responsibilities and duties.
- Sets schedules, develops procedures for meeting critical project deadlines.
- Operationalizes and refines the data collection plan and sets schedules.
- Monitors adherence to project time line.
- Has prime responsibility for budgetary matters. Approves all project expenditures.
- Writes monthly progress reports.

3. Deputy Project Manager

- Assists the Project Manager and performs duties as assigned by the Project Manager.
- Coordinates all day-to-day operations.
- Directs staff activities and coordinates staff functions.
- Serves as liaison between contractor and school personnel when Field Supervisors are in the field.
- Facilitates regular staff meetings.
- Writes all major correspondence to schools and supervises mailings.

- Supervises all data collection personnel.
- Monitors adherence to the qualitative and quantitative specifications of the data collection plan.
- Develops the logistical plans for field staff.
- Develops data collection staff training program and manual; supervises training of field staff.
- Works closely with Measurement and Instrument Specialist and identifies practical problems associated with the instruments.

4. Sampling and Data Analysis Supervisor

- Has prime responsibility for directing all data analysis and sampling procedures.
- Interprets data and helps write the final report.
- Has prime responsibility for writing the interim report.
- Specifies and refines procedures for sample selection and selects sample.
- Creates sampling matrix and supervises the filling of sample cells.
- Performs statistical analyses.
- Assigns responsibilities and supervises activities of computer programmer, research assistants and key punchers.

5. Computer Programmer

- Programs data and runs programs as determined by the Sampling and Data Analysis Supervisor.

6. Data Analysis Research Assistants (3)

- Edits, codes and conducts validity checks on data.
- Tabulates and summarizes data under the direction of the Sampling and Data Analysis Supervisor.

7. Field Supervisors (2)

- Coordinates and conducts telephone screening of teachers during sampling stage.
- Directly supervises the activities of the field data collection staff (one is in charge of staff working in the Eastern part of the U. S. and the other is in charge of those working in the Western part of the U. S.).
- Makes unannounced visits to classrooms where data is being collected to monitor activities of the field staff. (Spends over 75% of time in the field.)
- Evaluates performance of field staff and makes recommendations for replacements if needed.
- Trains field data collection staff.
- Reviews completed instruments for accuracy and completeness.
- Regularly reports progress and problems in the field to the Deputy Project Manager.
- Makes logistical arrangements for field staff. (Works with travel agency.)
- Coordinates and conducts telephone screening of teachers during sample stage.
- Serves as prime liaison between project and school personnel.
- Tabulates and records responses from Superintendents, Prinicpals, and Teachers to initial inquiries requesting project participation.
- Makes all follow-up calls to school personnel.
- Monitors receipt of Student Activity Log and makes necessary follow-up calls.

8. Field Data Collectors (25)-(5 Alternates)

- Each makes 4 site visits to approximately 10 schools in the sample as scheduled.
- Administers all study instruments and conducts interviews.
- Trains teachers in the use of the Student Activity Log and helps teachers to determine objectives.
- Monitors teacher performance in keeping the Student Activity Log and makes appropriate recommendations.
- Conducts classroom observations and completes Classroom Observation Instruments.
- Reviews all completed instruments for errors and completeness.
- Determines and attempts to solve any problems associated with particular schools and teachers.
- Keeps accurate records and reports of all travel expenditures.

9. Measurement and Instrument Specialist

- Determines and makes necessary revisions in all study instruments.
- Sets up and coordinates instrument pretest.
- Writes OMB package.
- Obtains copies of all study instruments (places orders with publishers; has unpublished instruments printed).
- Writes procedures for administering instruments for inclusion in field staff training manual.
- Trains Data Collection Supervisor on the administration of instruments.

- Consults with Data Collection Supervisor on practical problems related to administration of instruments.

10. Instrument Research Assistant

- Assists with writing the OMB package.
- Conducts instrument pretest.
- Makes necessary revisions in instruments at the direction of the Measurement and Instrument Specialist.

C. PROJECT TIME LINE

1. Overview and Anticipated Scheduling Problems

The project has been scheduled to be conducted in a period of 18 months beginning on Feb. 2, 1976 and ending July 31, 1977. This schedule has been created primarily to be responsive to the constraint indicated in the RFP which states that the final report must be completed by July, 1977. CRI anticipates that this constraint will be a major problem to the contractor.

Since there was no project starting date indicated in the RFP, CRI has only been able to estimate a reasonable time period which would allow NIE to decide upon a design, select a contractor and make the award. We allowed five months for this process. Since schools will be closing in June, 1976 and 3rd grade students will become 4th grade students in Sept., 1976, it is not advisable to begin data collection before the close of the 1975-76 school year. Therefore, data collection should not begin until the 1976-77 school year commences.

Because the design calls for pre-and-post-testing of students and teachers, optimally a full school year would be desirable to allow maximum change to occur. On the other hand, the voluminous amount of data necessitated by the study and the time needed to digest the data in order to recommend policy appears to actually require no less than six months for data analysis and interpretation.

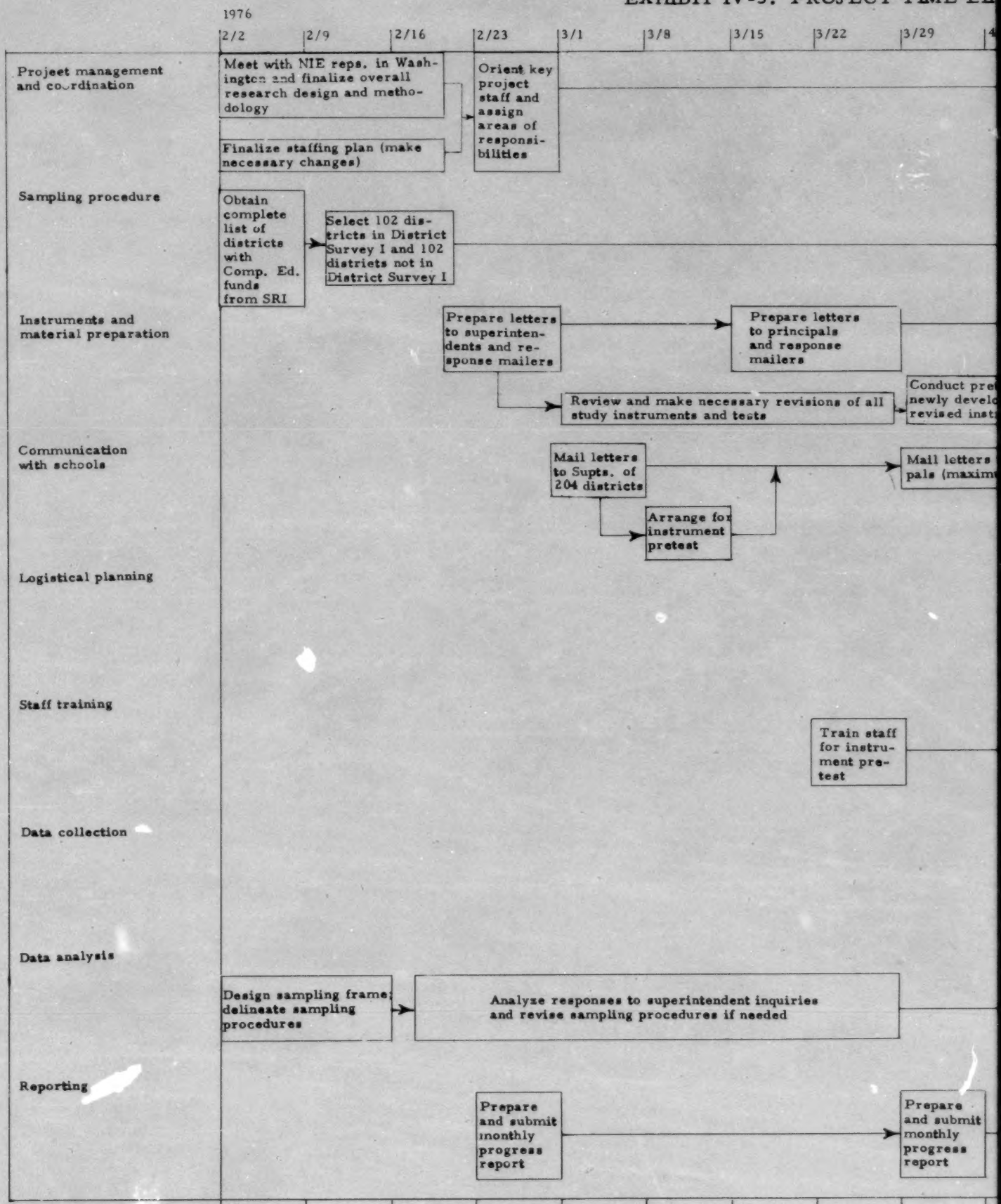
Since only eleven months existed between the opening of school (Sept., 1976) and July, 1977, a compromise was necessary. Consequently, allowing for loss of time due to school start up and holidays, six months were allowed for data collection and three months were allowed for data analysis and report writing.

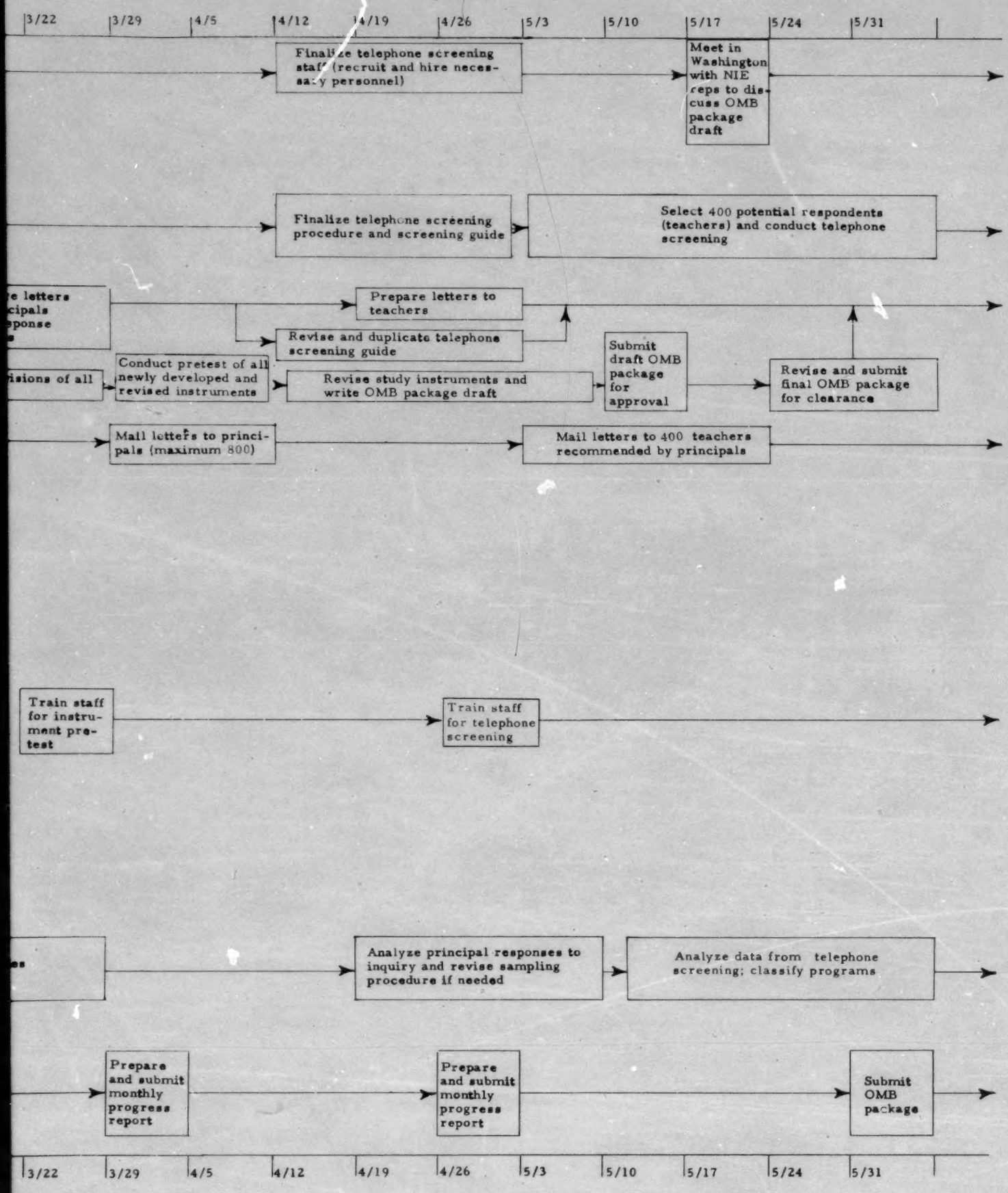
It is our deliberated opinion that the compromise we have proposed is feasible but will place extraordinary demands on the contractor with respect to data analysis and final report development. CRI suggests as an option that NIE review the possibility of lifting the July, 1977

constraint and report to Congress later in its session in order to allow at least five months for data analysis. This would cause the final report to be submitted in October, 1977.

The compromise schedule which CRI has developed is detailed in Exhibit IV-3: Project Time Line.

EXHIBIT IV-3: PROJECT TIME LI


1976
2/2
2/9
2/16
2/23
3/1
3/8
3/15
3/22
3/29
Projeet management and coordination
Meet with NIE reps. in Washingtcn and finalize overall research design and methodology
Orient key project staff and assign areas of responsibilities
Finalize staffing plan (make necessary changes)
Sampling procedure
Obtain complete list of districts with Comp. Ed. funds from SRI
Select 102 districts in District Survey I and 102 districts not in District Survey I
Instruments and material preparation
Prepare letters to superintendents and response mailers
Prepare letters to principals and response mailers
Review and make necessary revisions of all study instruments and tests
Communication with schools
Mail letters to Supts. of 204 districts
Arrange for instrument pretest
Logistical planning
Staff training
Train staff for instrument pretest
Data collection
Data analysis
Design sampling frame; delineate sampling procedures
Analyze responses to superintendent inquiries and revise sampling procedures if needed
Reporting
Prepare and submit monthly progress report
Prepare and submit monthly progress report


3/22
3/29
4/5
4/12
4/19
4/26
5/3
5/10
5/17
5/24
5/31
Finalize telephone screening staff (recruit and hire necessary personnel)
Meet in Washington with NIE reps to discuss OMB package draft
Finalize telephone screening procedure and screening guide
Select 400 potential respondents (teachers) and conduct telephone screening
Prepare letters to teachers
Revise and duplicate telephone screening guide
Conduct pretest of all newly developed and revised instruments
Revise study instruments and write OMB package draft
Submit draft OMB package for approval
Revise and submit final OMB package for clearance
Mail letters to principals (maximum 800)
Mail letters to 400 teachers recommended by principals
Train staff for instrument pretest
Train staff for telephone screening
Analyze principal responses to inquiry and revise sampling procedure if needed
Analyze data from telephone screening; classify programs
Prepare and submit monthly progress report
Prepare and submit monthly progress report
Submit OMB package
3/22
3/29
4/5
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4/19
4/26
5/3
5/10
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5/24
5/31

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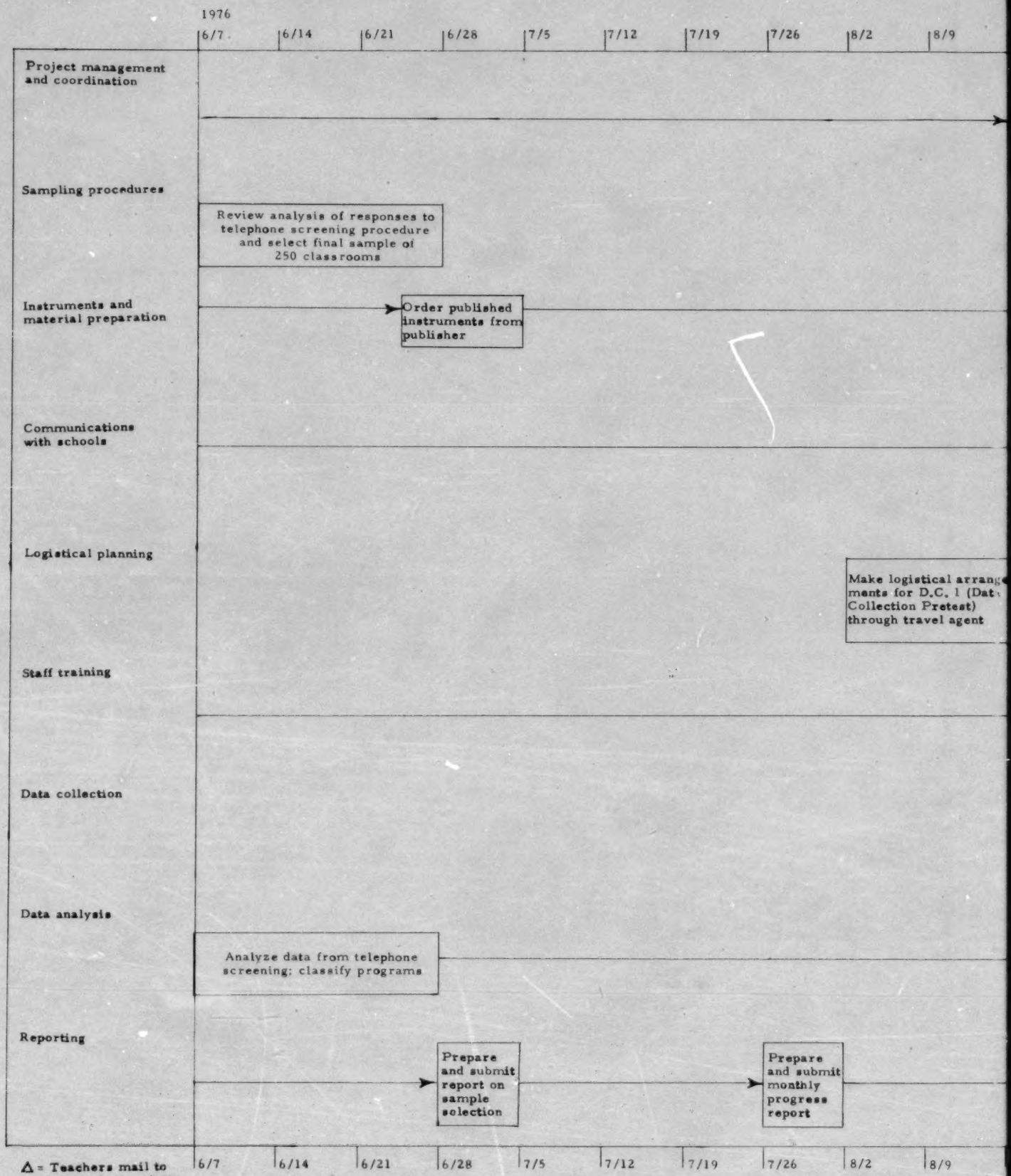

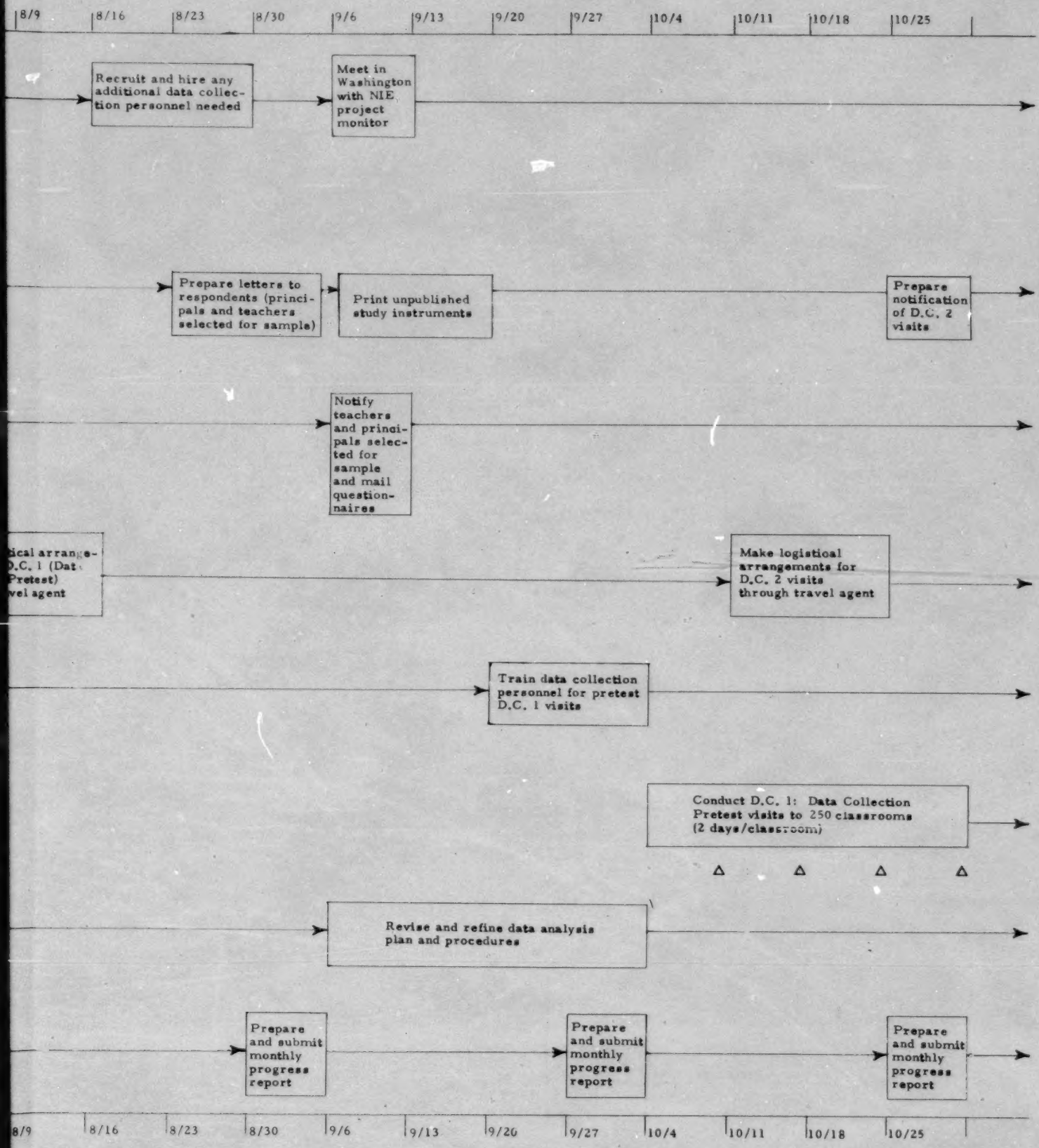
8/9
8/16
8/23
8/30
9/6
9/13
9/20
9/27
10/4
10/11
10/18
10/25
Recruit and hire any additional data collection personnel needed
Meet in Washington with NIE project monitor
Prepare letters to respondents (principals and teachers selected for sample)
Print unpublished study instruments
Prepare notification of D.C. 2 visits
Notify teachers and principals selected for sample and mail questionnaires
tical arrange- D.C. 1 (Dat Pretest) vel agent
Make logistical arrangements for D.C. 2 visits through travel agent
Train data collection personnel for pretest D.C. 1 visits
Conduct D.C. 1: Data Collection Pretest visits to 250 classrooms (2 days/classroom)
Revise and refine data analysis plan and procedures
Prepare and submit monthly progress report
Prepare and submit monthly progress report
Prepare and submit monthly progress report
8/9
8/16
8/23
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10/25

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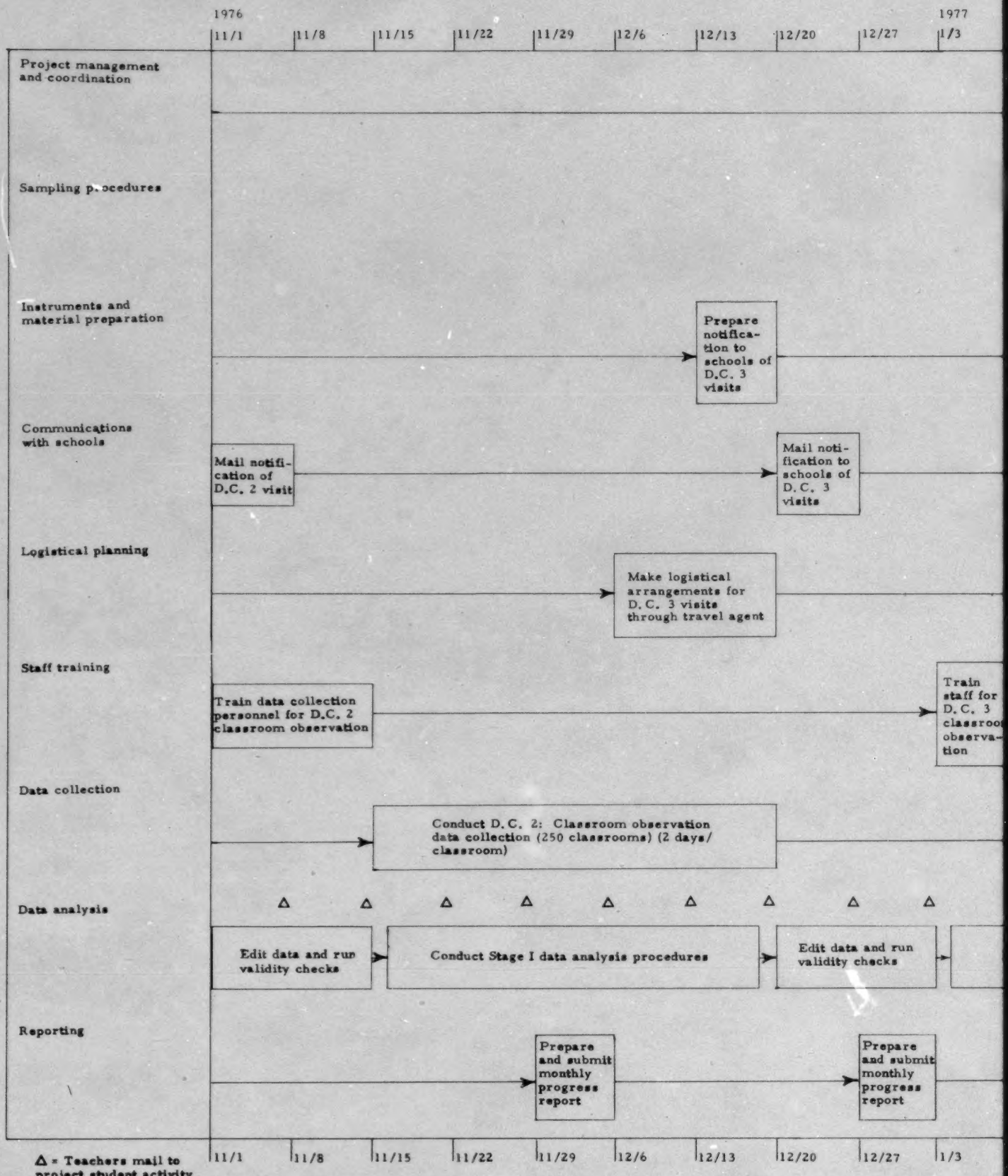

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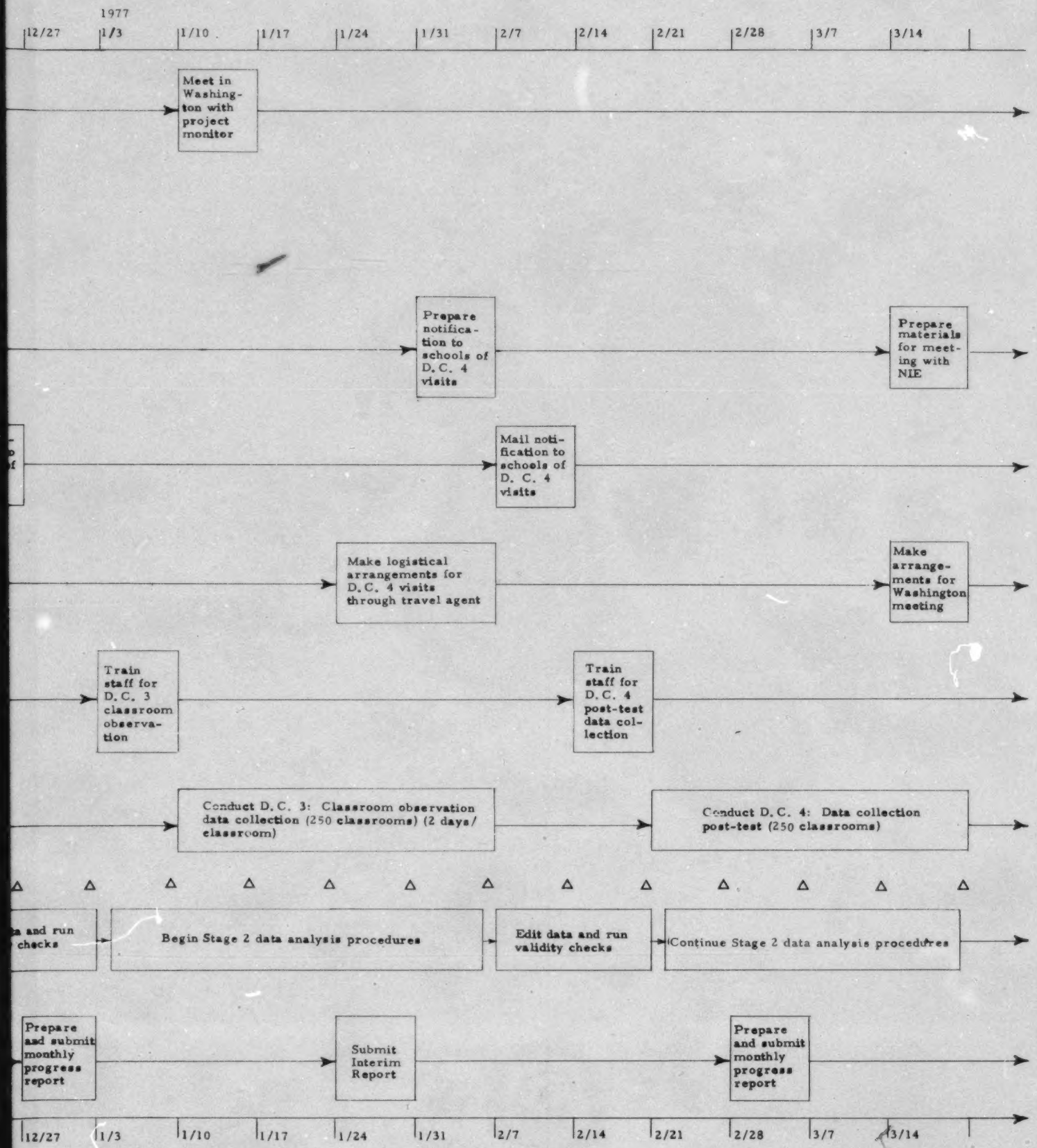
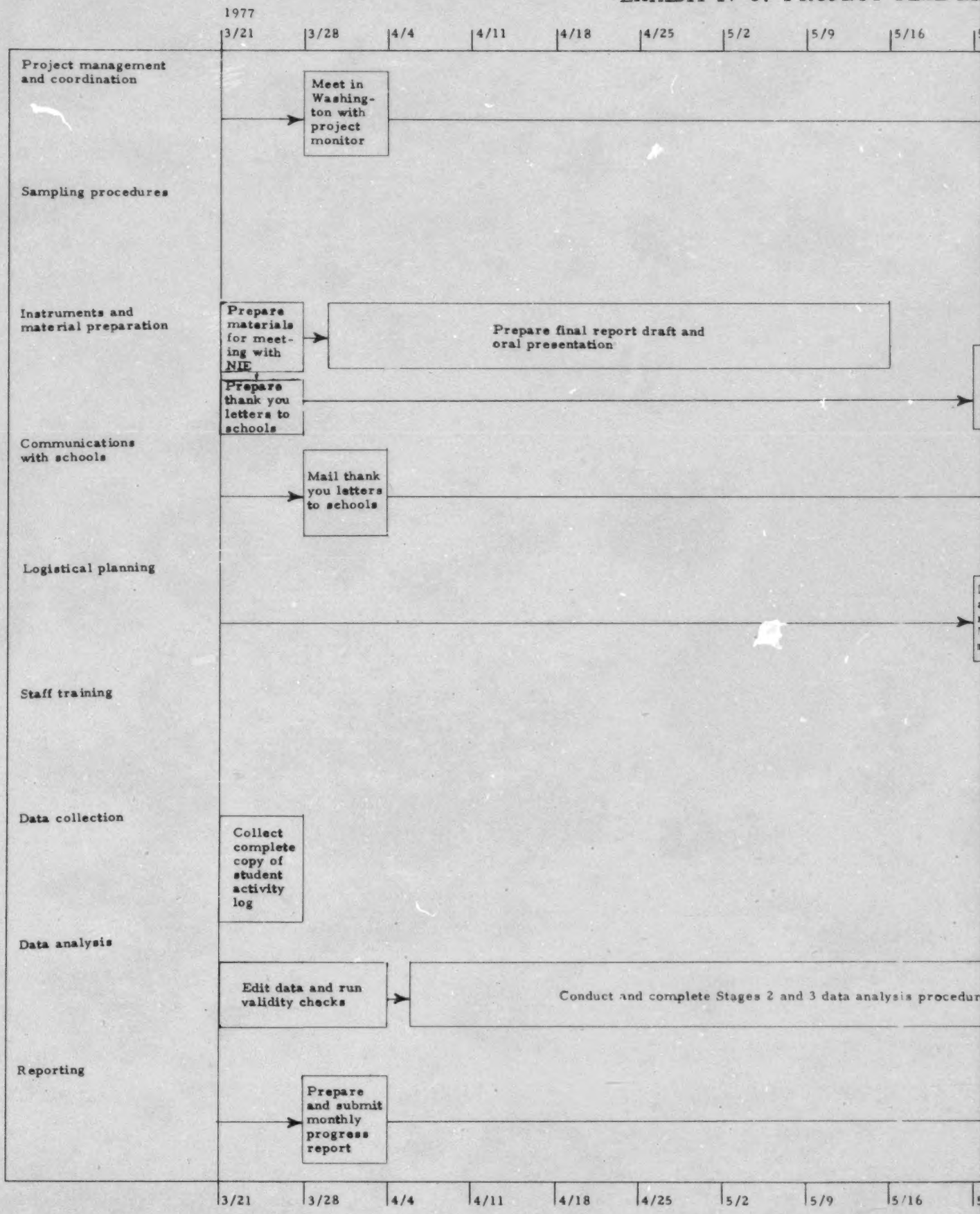

1977
12/27
1/3
1/10
1/17
1/24
1/31
2/7
2/14
2/21
2/28
3/7
3/14
Meet in Washington with project monitor
Prepare notification to schools of D. C. 4 visits
Prepare materials for meeting with NIE
Mail notification to schools of D. C. 4 visits
Make logistical arrangements for D. C. 4 visits through travel agent
Make arrangements for Washington meeting
Train staff for D. C. 3 classroom observation
Train staff for D. C. 4 post-test data collection
Conduct D. C. 3: Classroom observation data collection (250 classrooms) (2 days/classroom)
Conduct D. C. 4: Data collection post-test (250 classrooms)
Begin Stage 2 data analysis procedures
Edit data and run validity checks
Continue Stage 2 data analysis procedures
Prepare and submit monthly progress report
Submit Interim Report
Prepare and submit monthly progress report

EXHIBIT IV-3: PROJECT TIME LI



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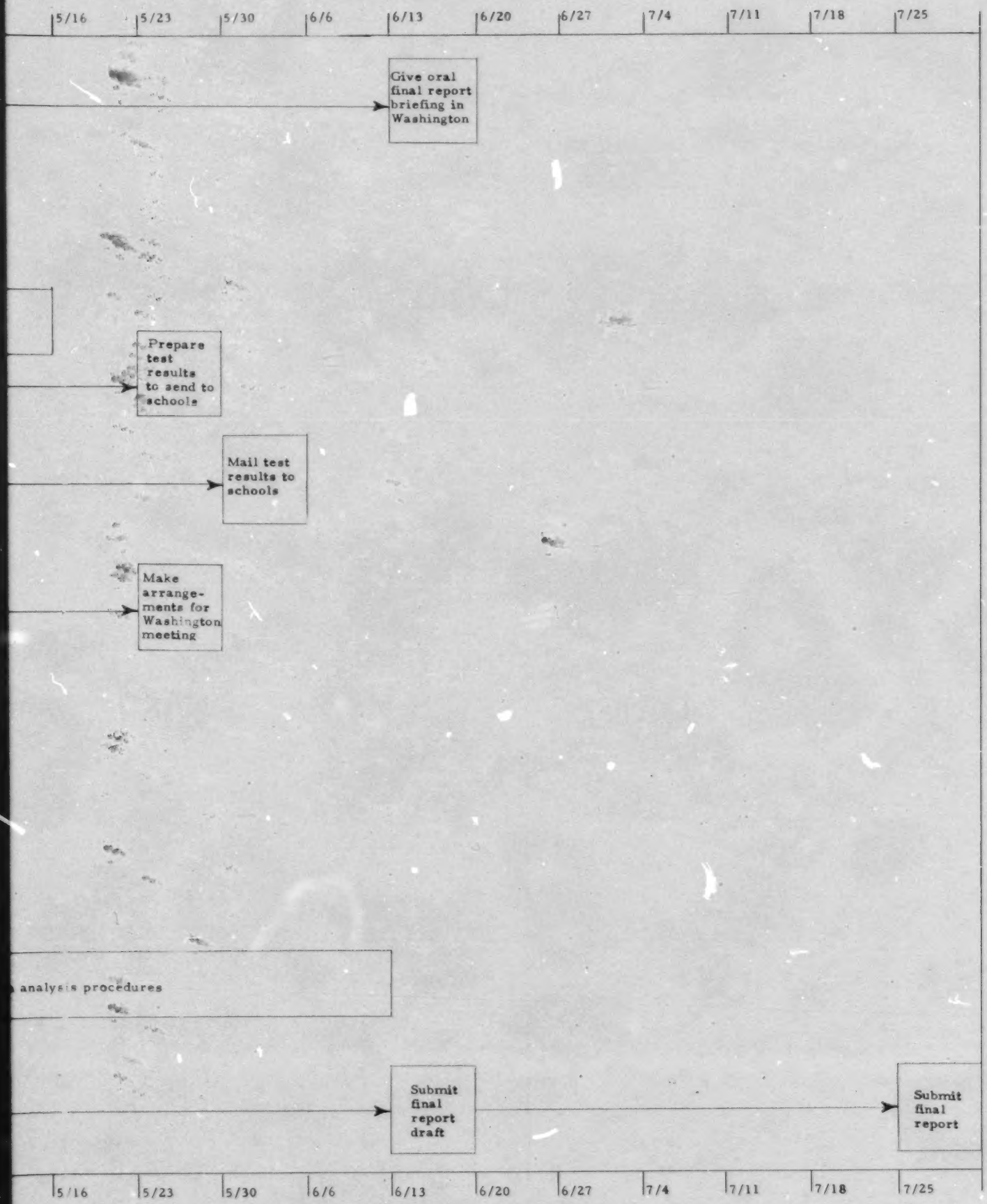

D. PROJECT REPORTING

Four major types of reports are to be provided by the contractor to NIE. A description of the essential content of these reports is provided below:

1. Monthly Progress Reports

At the end of each month (except those when other reports are due) the contractor should submit to NIE a progress report delineating, in letter form, the activities conducted during that month. This report should cover the tasks that were accomplished and any problems or difficulties encountered.

2. Task Products

Task products result from the completion of a major study task. There are two major task products of this study.

a. Final Sample Selection - This report should include the final sample of classrooms selected for study. Preliminary descriptive information on the classrooms and the completed sampling matrix should be included.

b. OMB Package - All of the instruments that are to be used in the study, justifications for their use, item justifications for newly created or revised instruments, and instrument administration information should be compiled into a report that is submitted to the Office of Management and Budget (OMB) for approval. The OMB package should meet the specifications designed by the OMB.

3. Interim Report

One interim report is to be compiled and submitted to NIE. This report should cover the results of Stage I of the data analysis. Specifically, the report should include preliminary empirically derived definition(s) of individualized instruction. It should also provide preliminary program treatment clusters and descriptions of their

characteristics. The report should be considered "preliminary" as the findings in these areas may change as the study progresses and more data is collected.

4. Final Report

The policy orientation of this research effort means that the final report should contain guidelines and recommendations regarding desirable and undesirable instructional practices. These recommendations should be based on sound research findings and analytical techniques. They also should be pragmatic, realistic, and relevant to existing program contraints and practices. In short, they should be feasible to implement in the near future, and have a reasonably high probability of success in terms of effecting measurable gains in student performance levels. Such a report would, therefore, have to describe in specific terms the kinds of educational practices and policies that actually influence student performance as well as the factors that must be considered in order to institute these practices and policies.

In all likelihood, the final report of this research effort will contain well documented scenarios of how to develop, implement, operate, and monitor instructional programs in a way that avoid common pitfalls and which provides a means for evaluating the extent to which each kind of program has been operationalized, (i.e., in terms of its key components) and achieved its goals. Since it is unlikely that one kind of program works "best" for all kinds of situations or students, the final report should address the question -- Which kinds of practices are likely to be most successful in which kinds of contexts?

The final report should be written in three separate volumes as follows:

Volume I: Executive Summary

A brief overview of the entire study for the executive decision maker and general public.

Volume II: Study Design

A description of the study conceptualization, methodology and instruments.

Volume III: Findings and Recommendations

A. Empirically derived definition(s) of individualization-standardization.

B. Program clusters and characteristics.

C. Impact of individualization-standardization on compensatory education students and teachers. Effective classroom practices.

D. Critical factors and processes that influence the effectiveness and extent of individualization.

E. Policy Recommendations Regarding:

1. Effective practices which can and should be adopted.

2. Adoption and implementation concerns and procedures.

3. Evaluation and monitoring concerns and procedures.

4. Implications for Federal, State and Local Compensatory Education Guidelines.

5. Implications for Federal, State and Local spending.

F. Reporting Schedule

Reporting due dates are as follows:

Monthly Progress Reports - End of each month except May, 1976; June, 1976; Jan., 1977; June, 1977; and July, 1977

Task Products:

OMB Package	May 31, 1976
Final Sample Selection	June 30, 1976
Interim Report	Jan. 31, 1977
Final Report Draft	June 17, 1977
Final Report (150 copies)	July 31, 1977

E. ESTIMATED BUDGET

The following budget is intended to provide NIE with an estimate of what it would cost to conduct the study. Since the contractor has not been selected, the actual costs cannot be calculated. The costs included in this budget have been based on actual CRI rates (Direct Labor, Payroll Related Expenses, Overhead, etc.). Therefore, the attached budget represents projected cost estimates of CRI.

Budget Summary

Reference					
1.	Direct Labor	Estimated Hours	Rate/ Hour	Estimated Cost(s)	
	Category No. 1	6,238	$ 14.12	$ 88,081	
	Category No. 2	5,718	9.22	52,720	
	Category No. 3	32,927	6.92	227,855	
	Category No. 4	4,679	4.90	22,927	
	Typing Support	6,238	4.10	25,596	$ 417,179
2.	Payroll related expense @ 27%				112,638
			Total Direct Labor:		529,817
3.	Total Travel				194,225
4.	Total Consultants				25,000
5.	Other Direct Costs				35,000
6.	Overhead (including G & A) @ 76.6% of Total Direct Cost				600,576
			Total Estimated Cost:		1,384,618
7.	Fee				114,231
			Total Estimated Cost and Fee:		$ 1,498,849

1. DIRECT LABOR

Assuming a start date of February 1, 1976, and an ending date of July 31, 1977, Direct Labor for the project was estimated as follows: $417,179

DIRECT LABOR IN MAN HOURS

	Category No. 1	Category No. 2	Category No. 3	Category No. 4	Typin Suppo
Project Manager	3,119				
Deputy Project Manager		3,119			
Project Technical Director	3,119				
Sampling & Data Analysis Supervisor		1,906			
Computer Programmer			433		
Data Analysis Research Assistants (3)				4,679	
Field Supervisors (2)			3,813		
Field Data Collectors (25) (5 alternates)			28,161		
Measurement & Instrument Specialist		693			
Instrument Research Assistant			520		
Typist					6,238
Total Man Hours:	6,238	5,718	32,927	4,679	6,238
Man Months (divided by 173.3):	36	33	190	27	36

2. PAYROLL RELATED EXPENSE

Payroll Related Expense refers to such expenses as vacation, holiday, sick leave, payroll taxes, group insurance, etc.

$112,638

3. TRAVEL

A. Field Work

(1) 108 Round Trip Los Angeles to various national locations @ $300 average/trip	$ 32,400	
(2) 2997 Days Per Diem @ $40/Day	119,880	
(3) 2295 Days Ground Transportation @ $15/Day	34,425	$186,705

B. LA/DC Project Coordination

(1) 2 Persons 8 Round Trip each LA/DC @ $370/Round Trip	$ 5,920	
(2) 32 Days Per Diem @ $40/Day	1,280	
(3) Ground Transportation @ $10/Day	320	7,520
Total Travel:		$194,225

4. CONSULTANTS

250 Teachers (one per school) to be paid $100 honorarium each one time $ 25,000

5. OTHER DIRECT COSTS

A. Computer Time & Keypunch		$ 12,000
B. Communications		
(1) Long Distance Telephone	$ 3,600	
(2) Postage and Shipping	1,800	5,400
C. Reproduction		
(1) Xerox	$ 2,700	
(2) Final Report Printing	5,000	7,700
D. Supplies		1,800
E. Tests and Instruments (Approximately 37,500) and Associated Training Fees		9,000
Total Other Direct Costs:		$ 35,000
Total Direct Cost:		$ 784,042

6. OVERHEAD (Including G & A)

Overhead (including G & A) contains traditional overhead expenses as overhead salaries, overhead travel, rent, utilities, etc.

	$ 600,576
Total Estimated Cost:	$ 1,384,618

7. FEE @.0825 $ 114,231

Total Estimated Cost and Fee: $ 1,498,8[illegible]

V. UTILIZATION OF THE FINAL REPORT

A. TARGET AUDIENCE FOR THE FINAL REPORT

The policy nature of the proposed study dictates that the final report should be oriented towards policy makers at the federal, state, district and school levels as well as curriculum developers in the private and public sectors. Additionally, the study is likely to be of interest to educational researchers in terms of study procedures and methodology. While policy makers at all levels have concerns related to recommended educational practices, they each will probably view these recommendations from different perspectives. The nature of these target audiences' particular concerns and how the report should satisfy their needs is described below.

1. Federal Level Policy Makers

Policy makers at the Federal level, include Congressmen, National Institute of Education and Office of Education program administrators. These individuals are likely to be particularly concerned with implications related to changing and/or adding to Federal Compensatory Education Guidelines and federal spending.

To meet Federal policy makers concerns, CRI has recommended that the final report include specific sections which address policy questions regarding Federal guidelines and spending questions such as:

- Should individualized instruction be mandated?
- What source and level of funding should be associated with individualized instruction?
- Considering the differences in various contextual settings, can broad based guidelines which cut across these contexts be developed, and if so, what should they be?
- If mandated, how could compliance with guidelines concerning individualization be monitored?

2. State Level Policy Makers

State level policy makers include state legislators, boards of education and educational agency program administrators. These individuals are likely to have the same concerns as the federal level policy makers but from a state perspective. It is basically the responsibility of the states to operationalize Title I and other categorical programs guidelines and monitor compliance. In addition, they develop guidelines and set spending levels for state-operated compensatory education programs.

To meet the concerns of State level policy makers, CRI has recommended that the final report include specific sections which address policy questions regarding State guidelines, the operationalization of Federal guidelines and State monitoring/evaluation/compliance such as:

- How can state compensatory education programs compliment and enhance Federal programs?
- How can Federal guidelines be operationalized?
- What seems to be the practical problems in monitoring individualized instructional programs?
- What demands can be placed on local districts with respect to individualization/standardization?

3. District and School Level Policy Makers

This group of policy makers include local boards of education, local educational agency administrators (especially District Compensatory Education Directors) and school principals. These individuals are likely to be most concerned with implementation/adoption problems and procedures.

To meet these concerns, CRI has recommended that the final report include a specific section which addresses adoption/implementation policy questions such as:

- What practical problems can the District expect in implementing newly recommended instructional approaches? What concerns will teacher/parents, students and other community residents have?
- What level of funding is required to adequately meet any implementation demands?
- Does it seem likely that the recommended instructional approaches will really increase compensatory education students achievement?

B. DISSEMINATION/UTILIZATION RECOMMENDATIONS

1. Analysis of the Problems

The growing emphasis on accountability of social programs has also affected the way in which social research itself is viewed. A decade of reports and studies that have "sat on the shelf" of government offices has led to the demand that Federally funded research reach the largest possible target audience.

CRI's recommendations concerning dissemination and utilization are based on several years experience as a contractor responsible both for producing research reports that would be widely disseminated and utilized, and for developing systems and materials for dissemination to educators around the country. CRI is thus particularly sensitive to the problems of dissemination and utilization of knowledge in education. These recommendations are empirically based on our experience with the problems, as well as on research and the knowledge gained from conducting a conference for NIE in 1974 on increasing the use of information about innovative or promising educational practices.

The major reasons for the lack of utilization of research studies include:

- Ineffective, and undifferentiated presentation of the information such that potential target audiences cannot determine whether the study would be of interest and use to them.
- Lack of involvement of critical linking agents -- those people who serve as channels of information about information for different potential target audiences.
- Lack of an effective nationwide dissemination "system" in education, particularly for educational policy makers and program managers.

The first reason leads to recommendations as to how the contractor should be required to develop and organize the final report; the second and third lead to actions that NIE should take to facilitate dissemination and utilization.

2. Presentation and Organization of the Final Report

In the preceding section, the various policy makers were identified whom CRI believes will have a substantial interest in and use for the information from the study. CRI would recommend that the contractor be required to write specific chapters in the findings and recommendations - volumes which can be pulled out as separate documents for wider dissemination. The most effective format for communication with policy makers would be to have a section or chapter, specifically titled "For Federal Education Policy Makers".

The findings and recommendations should be in a question and answer format, such as "What are the costs associated with effective individualized instruction programs?" It is critical to ask the contractor to develop documents that specifically address the various target audiences. NIE should not assume that the general executive summary volume will in itself communicate directly to the different types of concerns, or that "somehow", after the report is completed, some of NIE staff will have either the time or the ability to develop these materials. The

requirement that the contractor develop effective, differentiated materials for reaching a broad and differentiated target audience, has not been a common practice in Federal contracting; it is well within the capability of the contractor, and would further serve to ensure that the analysis itself address a variety of policy issues and questions.

The executive summary itself we see as primarily a document for NIE and Congress, addressing their concerns and presenting an overall view of the work done. As such it would not contain extensive technical discussion of the data from the different perspectives of State and local program planners, educational researchers, etc.

3. Involvement of Linking Agents

One major mistake, made over and over again by those responsible for information dissemination, has been to focus all of their attention on the written document, ignoring the need for person-to-person contact. Research on information utilization, whether the user is a highly trained researcher, or a local superintendent of schools, has shown that people still rely on word-of-mouth recommendations (Rogers, 1962; Glaser and Taylor, 1969; Shuy, 1973). The same research shows that to this point, formal information retrieval systems are used least often in arriving at solutions to pressing problems (Garvey and Griffith, 1967).

Part of an effective dissemination strategy, therefore, is to identify key resource persons and the channels of communication they influence. These resource persons can become key figures in making others aware of the report and its contents. For example, USOE Title I administrators for the various regions are key personal contacts for state Title I personnel. Superintendents, as reported by Shuy, identify with professional journals such as Phi Delta Kappan, and the publications of the AASA. The editors of these publications, who are also involved in yearly conventions and association meetings, and have thus established personal contacts, become key linking agents for reaching the large target audience of school superintendents and

their staff. So too, do the Title I administrators at each state. NIE would need to map out the key individuals once their interest in the report is raised and they could become effective channels of communication to others.

The most effective way to begin involving members of the key target audiences would be through workshops, possibly held for Federal and State Title I administrators, and other national educator-communicators concerned with improving educational practices. The medium of a workshop is one of the most effective and least expensive ways to initiate dissemination of information.

4. Dissemination Systems

As noted earlier, the field of education is so vast, and diverse, that no single dissemination system has yet been established to which one can turn and be assured that a given study or report will be disseminated to potential users.

Fortunately, NIE's Division of Dissemination and Resources, has been involved in sponsoring a diverse group of local, state, and regional information centers and services, in addition to the ERIC system. Unlike ERIC, these centers have developed strong personal networks for disseminating information, and together, they reach an increasing number of educators and program planners at state and local levels. Because these systems and centers are very user-oriented and responsive, they are actively involved in seeking out information and materials to meet user needs, and many transfer technical reports into more initially useful summaries. CRI utilized several of these centers as sources of information on individualized instruction for this contract, and believes that most of the centers already are providing substantial information on individualized instruction. The final report could be disseminated by such centers and services without further effort on NIE's part, if it were made available to them.

The following Exhibit V-1 lists some of the State Departments of Education which are most active in disseminating information on educational practices, and Exhibit V-2 lists a selected group of information centers serving local, State, and regional/national areas. A more complete and up-to-date list could be obtained from staff of NIE's Office of Dissemination and Resources.

Exhibit V-1

Selected State Education Agencies Involved in Dissemination

Coordinator, Educational Programs & Studies Information Services
State Department of Education
Albany, New York 12224

Division of Dissemination
Texas Education Agency
Austin, Texas 78701

Office of Planning & Dissemination
South Carolina State Office Building, Rm. 1208
Columbia, South Carolina 29201

Educational Consultant
Division of Development
State Department of Education
Raleigh, North Carolina 27602

Kansas State Department of Education
120 East 10th Street
Topeka, Kansas 66612

Coordinator, Title III ESEA
State Department of Education
Salt Lake City, Utah 84111

Iowa State Department of Public Instruction
Grimes Office Building
Des Moines, Iowa 50319

Experimental & Demonstration Centers Program
State Department of Education
Lansing, Michigan 48902

Office of Program Development
State Department of Education
Trenton, New Jersey 08625

Bureau of Technical Assistance
Rhode Island Department of Education
25 Hayes Street
Providence, Rhode Island 02908

Arizona Department of Education
1535 West Jefferson
Phoenix, Arizona

Education Information Center
Rhode Island Department of Education
25 Hayes Street
Providence, Rhode Island 02908

South Carolina State Department of Education
Rutledge State Office Blvd., Rm. 1203
Columbia, South Carolina 29201

Director of Dissemination
State Department of Education
Boise, Idaho 83706

Florida State Dept. of Education
Knott Building
Tallahassee, Florida 32304

Kansas State Department of Education
120 East 10th Street
Topeka, Kansas 66612

Southwestern Educational Development Center
1552 West 200 North
Cedar City, Utah 84401

Division of Development
State Department of Education
Public Instruction Department
Raleigh, North Carolina 27602

Exhibit V-1
(Cont'd)

Central Utah Educational
Service Agency
P. O. Box 607
Richfield, Utah 84701

Research Coordinating Unit
State Department of Education
Jefferson City, Missouri 65101

Exhibit V-2

Selected Information Centers

San Mateo County Educational
Resource Center (SMERC)
333 Main Street
Redwood City, California 94063

Director,
Instructional Materials Program
California Polytechnic State
University
San Luis Obispo, California 93401

ERIC Center for Science,
Mathematics & Environmental
Education
The Ohio State University
1800 Cannon Drive
400 Lincoln Tower
Columbus, Ohio 43210

Director, Educational Products
Information Exchange (EPIE)
463 West Street
New York, New York 10014

Executive Director, Social Science
Education Consortium, Inc.
855 Broadway
Boulder, Colorado 80302

Director, Educational Resource Center
Area Cooperative Educational Services
800 Dixwell Avenue
North Haven, Connecticut 06511

Director, Information Services
Merrimack Education Center
101 Mill Road
Chelmsford, Massachusetts 01824

Research and Information Services
for Education
198 Allendale Road
King of Prussia, Pennsylvania 19406

Director, Board of Cooperative
Services
830 South Lincoln
Longmont, Colorado 80501

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APPENDIX A. STUDENT NON-COGNITIVE INSTRUMENTS

SCHOOL ATTITUDE SURVEY

Harold F. Burks, Ph.D.

FEELINGS I HAVE ABOUT SCHOOL

My Name _____ Age _____
First Last

Grade _____ Teacher _____ Date _____

Do some things in school bother you? Your teacher would like to know what they are. Maybe these things can be changed so they do not upset you so much. Put an X in the box which best describes your feelings. The X's might be easier to see if you use a colored pencil.

ABOUT THE THINGS WE LEARN

1. About My School Work

☐	☐	☐
I think I am doing all right.	Sometimes I worry because I am not doing very well.	Often I worry because I am not doing very well.

2. About Grades and Marks

☐	☐	☐
I don't worry about grades and marks.	Sometimes I worry about grades and marks.	Often I worry about grades and marks.

3. About Things I Am Supposed To Do in the Classroom

☐	☐	☐
I usually know what I am supposed to do.	Sometimes I am not sure what I am supposed to do.	Often I am not sure what I am supposed to do.

4. About Reading

☐	☐	☐
I think I am a good reader.	Sometimes I worry that I am not a good reader.	Often I worry that I am not a good reader.

5. About the Things I Read in School

☐	☐	☐
The things I read are interesting.	The things I read are a little bit interesting.	The things I read are not interesting.

6. About Spelling

☐	☐	☐
Spelling is no problem to me.	Sometimes I worry about spelling.	Often I worry about spelling.

7. About Writing

☐	☐	☐
Writing is no problem to me.	Sometimes I worry about my writing.	Often I worry about my writing.

8. About Arithmetic

☐	☐	☐
Arithmetic is no problem to me.	Sometimes I worry about arithmetic.	Often I worry about arithmetic.

9. About Playing Ball

☐	☐	☐
Playing ball is no problem to me.	Sometimes I worry about playing ball.	Often I worry about playing ball.

10. About How I Feel When I Play Games

☐	☐	☐
I enjoy playing games.	Sometimes I get nervous playing games.	Often I get nervous playing games.

11. About Rules for Playing Games

☐	☐	☐
I understand the rules for playing games.	Sometimes I don't understand the rules for playing games.	Often I don't understand the rules for playing games.

12. About Choosing Sides for a Game

☐	☐	☐
I don't worry about being chosen last.	Sometimes I worry because I am not chosen first.	Often I worry because I am chosen last.

13. About the Things We Study at School

☐	☐	☐
I like the things we do at school.	Sometimes I am not interested in the things we do at school.	Often I am not interested in the things we do at school.

14. About Being In School

☐	☐	☐
Most of the time I like being in school.	Sometimes I wish I was out of school.	Often I wish I was out of school.

ABOUT THE TEACHER AND ME

15. About the Teacher Helping Me

☐	☐	☐
The teacher helps me enough.	Sometimes I wish the teacher would help me more.	Often I wish the teacher would help me more.

16. About the Teacher Calling On Me for Answers

☐	☐	☐
The teacher calls on me as much as I want her to.	Sometimes I think the teacher calls on me too much or not enough.	Often I think the teacher calls on me too much or not enough.

17. About Things That Bother Me

☐	☐	☐
I can talk to the teacher as much as I want to about things that bother me.	Sometimes I wish I could talk to the teacher about things that bother me.	Often I wish I could talk to the teacher about things that bother me.

18. About Important Jobs in the Classroom

☐	☐	☐
I have enough important jobs to do.	Sometimes I wish I had more important jobs to do.	Often I wish I had more important jobs to do.

19. About Helping Other Children

☐	☐	☐
The teacher lets me help children as much as I want to.	Sometimes I wish the teacher would let me help children.	Often I wish the teacher would let me help children.

ABOUT THE OTHER CHILDREN AND ME

20. About Children in the Classroom Bothering Me

☐	☐	☐
The children don't bother me much.	Sometimes the children bother me.	The children bother me a lot.

21. About Making Friends at School

☐	☐	☐
I know how to make friends.	Sometimes I wish I knew some good ways to make friends.	Often I wish I knew some good ways to make friends.

22. About How the Children Think I Do Things

☐	☐	☐
The children think I do things well.	Sometimes I think the children don't think I do things well.	Often I think the children don't think I do things well.

23. About Being a Leader in the Classroom

☐	☐	☐
I am often a leader.	Sometimes I think I need to be more of a leader.	Often I think I need to be more of a leader.

24. About Sharing Things in the Classroom

☐	☐	☐
I share enough with the other children.	Sometimes I wish I could share more with other children.	Often I wish I could share more with other children.

25. About Talking with the Other Children

☐	☐	☐
I get to talk enough with the other children.	Sometimes I wish I could talk more with the other children.	Often I wish I could talk more with the other children.

26. About My Problems

☐	☐	☐
The children seem to understand my problems.	Sometimes I think the children don't understand my problems.	Often I think the children don't understand my problems.

27. About Saying What I Think

☐	☐	☐
I can say what I think to other children.	Sometimes I can't say what I think to other children.	Often I can't say what I think to other children.

ABOUT ME AND MY CLASSROOM

28. About How Close We Sit Together

☐	☐	☐
We sit the right distance from each other in the room.	Sometimes I think we sit too close or too far apart.	Often I think we sit too close or too far apart.

29. About Our Chairs in the Classroom

☐	☐	☐
Our chairs are easy to sit in.	Sometimes I think our chairs are hard to sit in.	Often I think our chairs are hard to sit in.

30. About the Noise in the Classroom

☐	☐	☐
The noise does not bother me.	Sometimes the noise bothers me.	Often the noise bothers me.

31. About the Blackboards

☐	☐	☐
It is easy to see what is on the blackboards.	Sometimes it is hard to see what is on the blackboards.	Often it is hard to see what is on the blackboards.

32. About Where You Can Be Alone in the Classroom

☐	☐	☐
If I want to there is a place to be alone.	Sometimes I wish there was a place to be alone.	Often I wish there was a place to be alone.

33. About Being Hungry at School

☐	☐	☐
I usually feel as if I had enough to eat.	Sometimes I feel hungry.	Often I feel hungry.

34. About the Light in the Classroom

☐	☐	☐
The light in the room does not bother me.	Sometimes the light bothers my eyes in the room.	Often the light bothers my eyes in the room.

35. About Being Tired at School

☐	☐	☐
I don't seem to get tired at school.	Sometimes I get tired at school.	Often I get tired at school.

36. About Hearing What the Teacher Says

☐	☐	☐
I can hear what the teacher says.	Sometimes I have trouble hearing what the teacher says.	Often I have trouble hearing what the teacher says.

You might like to go back now and circle the numbers of the things that bother you the VERY MOST.

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LOCUS OF CONTROL MEASURE FOR STUDENTS

developed by

Contemporary Research Incorporated

INSTRUCTIONS: Each student will have an answer sheet which will allow him to mark either "a" or "b" for each item by placing an X in the appropriate box. Clearly state the number of the item you are about to read and then read each item twice. Be sure that the students know which choice is "a" and which is "b" and that all have marked their responses before going on to the next item. An item may be repeated more than twice if necessary.

1. When new school work is easy for you to understand, it is because

   a. you are smart enough to understand it
   b. the teacher is doing a good job of explaining it

2. When you do well on a school test, it is because

   a. the test is easy
   b. you work hard

3. If someone thinks you don't do good work at school, it is because

   a. you don't do good work
   b. he doesn't understand what you are doing

4. When you get the right answers to math problems, it is because

   a. you are learning how to do math
   b. the problems are easy

5. When you have a hard time understanding your school work, it is because

   a. the lesson is very difficult
   b. you aren't smart enough

6. If you don't do well on a school test, it is because

   a. you didn't care about the test
   b. the test didn't make much sense

7. If you do better than usual on your school work, it is because

   a. you try harder
   b. the work was easier than usual

8. If something is easy to learn at school, it is because

   a. you really pay attention
   b. the teacher gives you lots of help

9. Suppose someone thinks you don't do good work at school

   a. you can make him change his mind if you want to
   b. some people will think you don't do good work no matter what you do

10. When you do a good job of reading, it is because

    a. you are getting better at reading
    b. the book was really easy to read

11. If you don't do very well on a school test, it is because

    a. you aren't very smart
    b. you were just unlucky

12. If someone tells you that you are dumb, it is because

    a. he is mad at you
    b. you did something dumb

13. If you did worse than usual on something at school, it was because

    a. the work is getting harder
    b. you were having a bad day

14. If a teacher tells you that you did fine work, it is because

    a. teachers usually say that to encourage pupils
    b. you really did do good work

15. When you do well on a school test, it is because

    a. you really knew the answers
    b. you were lucky

16. If you did worse than usualy at school, it was because

    a. you didn't try hard enough
    b. you weren't lucky

17. If you are chosen by other kids in your class to be on a team of some sort, it is because

    a. you are a good player
    b. they like you

18. When new school work is very hard to understand, it is because

    a. the teacher isn't giving you enough help
    b. you don't know enough to understand the new work

APPENDIX B. TEACHER NON-COGNITIVE INSTRUMENTS

LOCUS OF CONTROL INVENTORY FOR TEACHERS (READING)
developed by
Contemporary Research Incorporated

INSTRUCTIONS:

Teachers explain their students' performance in a variety of ways. The following list contains some factors often mentioned as important in determining student success or failure in learning to read. For each item below, indicate the extent to which you believe each factor is related to student performance. The first list concerns student success, the second list concerns student failure.

How strongly do you believe each of the factors listed below are related to success in learning to read well.

Scoring *			Strongly Related	Moderately Related	Rarely Related	Unrelated
(s)	a.	The student works carefully.				
(t)	b.	The teacher is creative.				
(s)	c.	The student likes the material.				
(t)	d.	The teacher likes the student				
(s)	e.	The student has developed good study habits.				
(s)	f.	The student is alert when instructions are given.				
(t)	g.	The teacher is able to individualize instruction.				
(s)	h.	The student has good academic ability.				
(t)	i.	The teacher communicates well with her students.				
(s)	j.	The student asks for help when he needs it.				
(t)	k.	The teacher gives a lot of time to each student				

* (S) = Student
(T) = Teacher

Scoring: (3) (2) (1) (0)

Scoring

			Strongly Related	Moderately Related	Rarely Related	Unrelated
(s)	l.	The student is motivated to learn.				
(t)	m.	Previous teachers prepared the student well for his present classwork.				
(s)	n.	The student has a long attention span.				
(t)	o.	The teacher is very patient.				
(t)	p.	The teacher allows the student to work at his own pace.				
		Scoring:	(3)	(2)	(1)	(0)

How strongly do you believe each of the factors listed below are related to failure to learn to read well.

Scoring

			Strongly Related	Moderately Related	Rarely Related	Unrelated
(s)	a.	The student's lack of confidence in himself.				
(t)	b.	Lack of teacher time in preparing a lesson.				
(s)	c.	The student doesn't care about learning.				
(s)	d.	The socioeconomic background of the student.				
(t)	e.	Teacher's lack of ability to communicate with students.				
(t)	f.	The teacher has a negative attitude toward the student.				
(s)	g.	The student doesn't listen well to the teacher.				
(s)	h.	The student is not able to keep up with the rest of the class.				
(t)	i.	The teacher doesn't motivation the student to want to learn.				
(s)	j.	The student doesn't like the teacher.				
(t)	k.	The teacher doesn't give enough time to each student.				
(s)	l.	The student is careless in his work.				
(t)	m.	The teacher does not attend to individual student needs.				
(t)	n.	The teacher's instructions are inclear.				
		Scoring:	(3)	(2)	(1)	(0)

Scoring

(s) o. The student doesn't have much academic ability.

(t) p. The teacher is not very creative.

	Strongly Related	Moderately Related	Rarely Related	Unrelated

Scoring: (3) (2) (1) (0)

LOCUS OF CONTROL INVENTORY FOR TEACHERS (MATH)
developed by
Contemporary Research Incorporated

INSTRUCTIONS:

Teachers explain their students' performance in a variety of ways. The following list contains some factors often mentioned as important in determining student success or failure in learning math. For each item below, indicate the extent to which you believe each factor is related to student performance. The first list concerns student success, the second list concerns student failure.

How strongly do you believe each of the factors listed below are related to success in learning math well.

Scoring

			Strongly Related	Moderately Related	Rarely Related	Unrelated
(s)	a.	The student works carefully.				
(t)	b.	The teacher is creative.				
(s)	c.	The student likes the material.				
(t)	d.	The teacher likes the student				
(s)	e.	The student has developed good study habits.				
(s)	f.	The student is alert when instructions are given.				
(t)	g.	The teacher is able to individualize instruction.				
(s)	h.	The student has good academic ability.				
(t)	i.	The teacher communicates well with her students.				
(s)	j.	The student asks for help when he needs it.				
(t)	k.	The teacher gives a lot of time to each student				

Scoring: (3) (2) (1) (0)

Scoring

(s)	l.	The student is motivated to learn.
(t)	m.	Previous teachers prepared the student well for his present classwork.
(s)	n.	The student has a long attention span.
(t)	o.	The teacher is very patient.
(t)	p.	The teacher allows the student to work at his own pace.

Strongly Related	Moderately Related	Rarely Related	Unrelated

Scoring: (3) (2) (1) (0)

How strongly do you believe each of the factors listed below are related to failure to learn math well.

Scoring

			Strongly Related	Moderately Related	Rarely Related	Unrelated
(s)	a.	The student's lack of confidence in himself.				
(t)	b.	Lack of teacher time in preparing a lesson.				
(s)	c.	The student doesn't care about learning.				
(s)	d.	The socioeconomic background of the student.				
(t)	e.	Teacher's lack of ability to communicate with students.				
(t)	f.	The teacher has a negative attitude toward the student.				
(s)	g.	The student doesn't listen well to the teacher.				
(s)	h.	The student is not able to keep up with the rest of the class.				
(t)	i.	The teacher doesn't motivation the student to want to learn.				
(s)	j.	The student doesn't like the teacher.				
(t)	k.	The teacher doesn't give enough time to each student.				
(s)	l.	The student is careless in his work.				
(t)	m.	The teacher does not attend to individual student needs.				
(t)	n.	The teacher's instructions are inclear.				
		Scoring:	(3)	(2)	(1)	(0)

Scoring

(s) o. The student doesn't have much academic ability.

(t) p. The teacher is not very creative.

	Strongly Related	Moderately Related	Rarely Related	Unrelated

Scoring: (3) (2) (1) (0)

APPENDIX C. CLASSROOM OBSERVATION INSTRUMENTS

CLASSROOM OBSERVATION INSTRUMENT

Classroom Summary Information

FOR NCS USE ONLY

DIRECTIONS: Make sure that all of the identifying information has been entered on the Classroom Summary Information form prior to your observation of physical environment. Do not make any stray marks outside the boxes provided in places where written information is required. Make sure you code the classroom summary information form booklet Identification Number in the I. D. grid of all booklets used in the observation.

TEACHER NUMBER

Grade: K 1 2 3 M

OBSERVER NUMBER

TODAY'S DATE: MO. DAY YR.

I. D. NUMBER

Teacher

School

City

Observer

CLASSROOM SUMMARY INFORMATION

0 1 2 3 4 Number of teachers that regularly work in the classroom.

0 1 2 3 4 Number of aides that regularly work in the classroom.

0 1 2 3 4 Number of volunteers/visitors present today.

Classroom Summary Information (Cont.)

A. Number of children enrolled

B. Number of children present today

Total Class Duration

- ○ 2½ hours
- ○ 3 hours
- ○ 3½ hours
- ○ 4 hours
- ○ 4½ hours
- ○ 5 hours
- ○ 5½ hours
- ○ 6 hours
- ○ 6½ hours
- ○ 7 or more hours

NCS Trans-Optic S387A-321

Physical Environment Information

(Mark all that apply.)

For each of the items below, mark all that apply:

① Present
② Used today

Seating Patterns:

- ○ Movable tables and chairs for seating purposes
- ○ Stationary desks in rows.
- ○ Assigned seating for at least part of the day.
- ○ Children select their own seating locations.
- ○ Teacher assigns children to groups.
- ○ Children select their own work groups.

GAMES, TOYS, PLAY EQUIPMENT

① ② small toys (trucks, cars, dolls and accessories
① ② puzzles, games
① ② wheel toys
① ② small play equipment (jumpropes, balls)
① ② large play equipment (swings, jungle gym)
① ② children's storybooks
① ② animals, other nature objects
① ② sandbox, water table
① ② carpentry materials, large blocks
① ② cooking and sewing supplies

INSTRUCTIONAL MATERIALS

① ② Montessori, other educational toys
① ② children's texts, workbooks
① ② math/science equipment, concrete objects
① ② instructional charts

AUDIO, VISUAL EQUIPMENT

① ② television
① ② record or tape player
① ② audio-visual equipment

GENERAL EQUIPMENT, MATERIALS

① ② children's own products on display
① ② displays reflecting children's ethnicity
① ② other displays especially for children
① ② magazines
① ② achievement charts
① ② child-size sink
① ② child-size table and chairs
① ② child-size shelves
① ② arts and crafts materials
① ② blackboard, feltboard
① ② child's own storage space
① ② photographs of the children on display

OTHER

① ② please specify . . . . . .

MAKE NO

STRAY MARKS

IN BLANK AREAS

CLASSROOM CHECK LIST (be sure to code EVERYONE in the class)

	ONE CHILD	TWO CHILDREN	SMALL GROUPS	LARGE GROUPS
1. Snack, lunch	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
2. Group time	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
Story 3. Music Dancing	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
4. Arts, Crafts	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
Guessing Games 5. Table Games Puzzles	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
○ TV ○ Audio-Visual Materials ○ Exploratory Materials ○ Math and Science Equipment ○ Texts, Workbooks ○ Puzzles, Games — Numbers 6. Math Arithmetic	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
Reading 7. Alphabet Lang. Development	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
Social Studies 8. Geography	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
Science 9. Natural World	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
Sewing Cooking 10. Pounding Sawing	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
11. Blocks Trucks	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
12. Dramatic Play Dress-Up	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
13. Active Play	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③ A ①②③ V ①②③ i ①②③	T ①②③④ A ①②③④ V ①②③④ i ①②③④	T ①② A ①② V ①② i ①②
14. RELIABILITY SHEET ○				

	ONE CHILD	TWO CHILDREN	SMALL GROUPS	LARGE GROUPS
15. Practical Skills Acquisition	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ ④ A ① ② ③ ④ V ① ② ③ ④ i ① ② ③ ④	T ① ② A ① ② V ① ② i ① ②
16. Observing	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ ④ A ① ② ③ ④ V ① ② ③ ④ i ① ② ③ ④	T ① ② A ① ② V ① ② i ① ②
17. Social Interaction Ob [ⓒ ② Ⓢ]	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ ④ A ① ② ③ ④ V ① ② ③ ④ i ① ② ③ ④	T ① ② A ① ② V ① ② i ① ②
18. Unoccupied Child	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ ④ A ① ② ③ ④ V ① ② ③ ④ i ① ② ③ ④	T ① ② A ① ② V ① ② i ① ②
19. Discipline	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ ④ A ① ② ③ ④ V ① ② ③ ④ i ① ② ③ ④	T ① ② A ① ② V ① ② i ① ②
20. Transitional Activities	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ ④ A ① ② ③ ④ V ① ② ③ ④ i ① ② ③ ④	T ① ② A ① ② V ① ② i ① ②
21. Classroom Management	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ ④ A ① ② ③ ④ V ① ② ③ ④ i ① ② ③ ④	T ① ② A ① ② V ① ② i ① ②
22. Out of Room	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ A ① ② ③ V ① ② ③ i ① ② ③	T ① ② ③ ④ A ① ② ③ ④ V ① ② ③ ④ i ① ② ③ ④	T ① ② A ① ② V ① ② i ① ②

NUMBER OF ADULTS IN CLASSROOM ⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

PREAMBLE

Focus Person Codes:
- 00 - The original class teacher
- 1-76 - Child codes
- 77 - Volunteer
- 88 - Teacher other than designated class teacher
- 99 - Aide to teacher

Activity	Focus Person Code
00	00
11	11
22	22
33	33
44	44
55	55
66	66
77	77
88	88
99	99

FOCUS PERSON
- ○ Child
- ○ Teacher
- ○ Aide
- ○ Volunteer

CONTINUATION OF PREVIOUS FOCUS ACTIVITY
- ○ Yes
- ○ No

Focus Person's Name and Number

(Do not write outside this box)

Number of Children ① ② Ⓢ Ⓛ

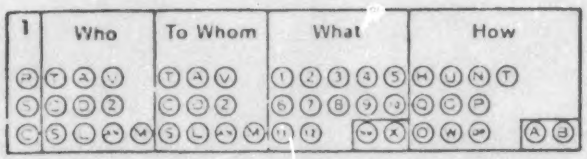
FOR NCS USE ONLY

0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

ADULT	Directing	Participating	Observing	Not Involved
Teacher	○	○	○	○
Aide	○	○	○	○
Volunteer	○	○	○	○

TIME STARTED

Hour		Minute	
⑧ Ⓒ ⑨ ⑩ ⑫		Ⓒ ① ②	⓪ ① ② ③ ④
① ② ③ ④ ⑤		③ ④ ⑤	⑤ ⑥ ⑦ ⑧ ⑨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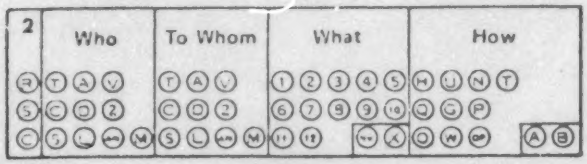
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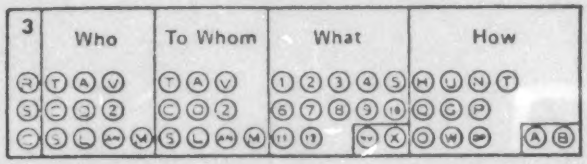
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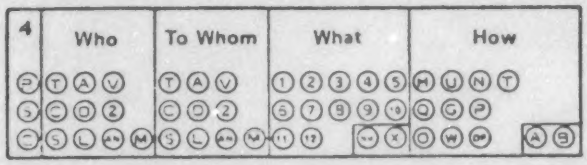
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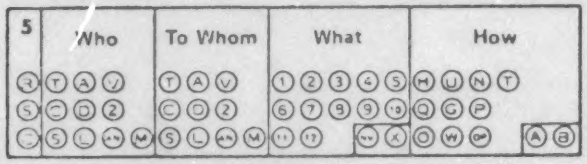
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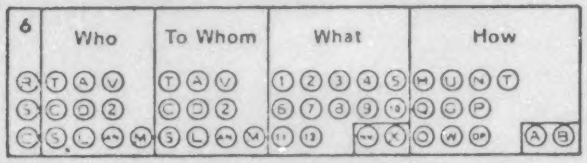
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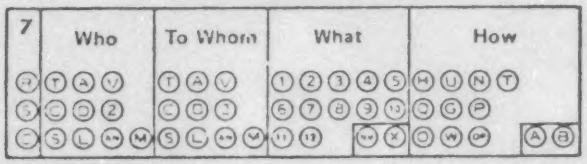
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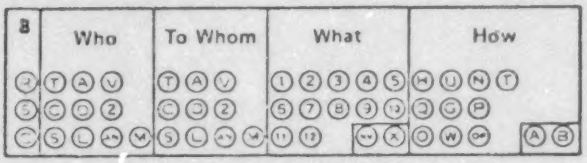
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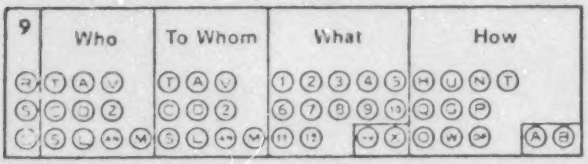
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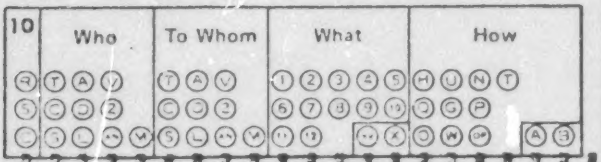
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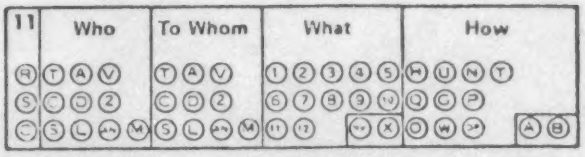
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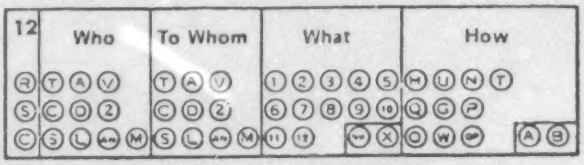
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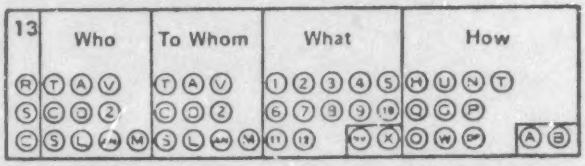
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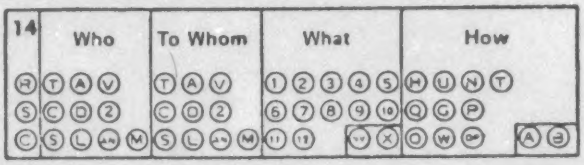
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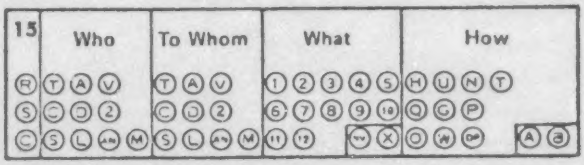
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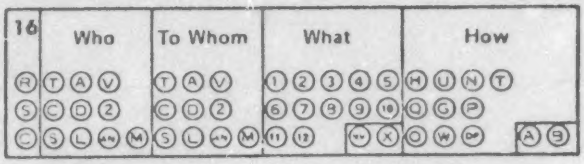
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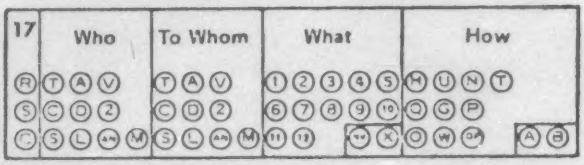
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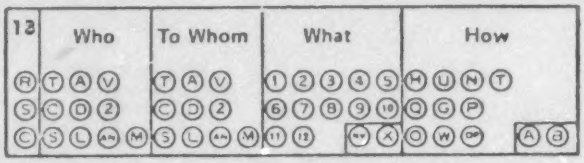
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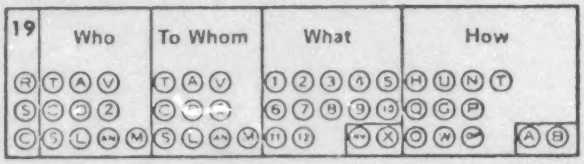
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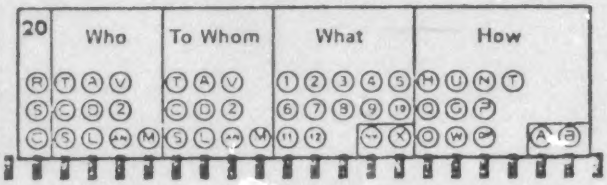
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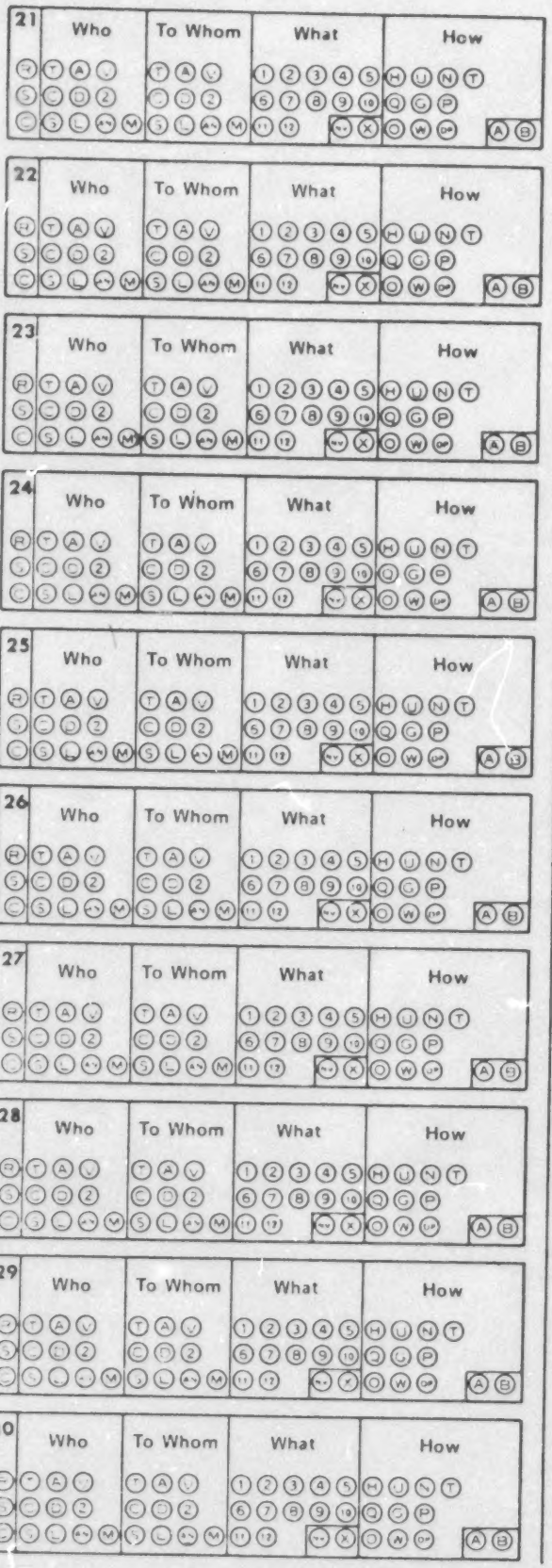
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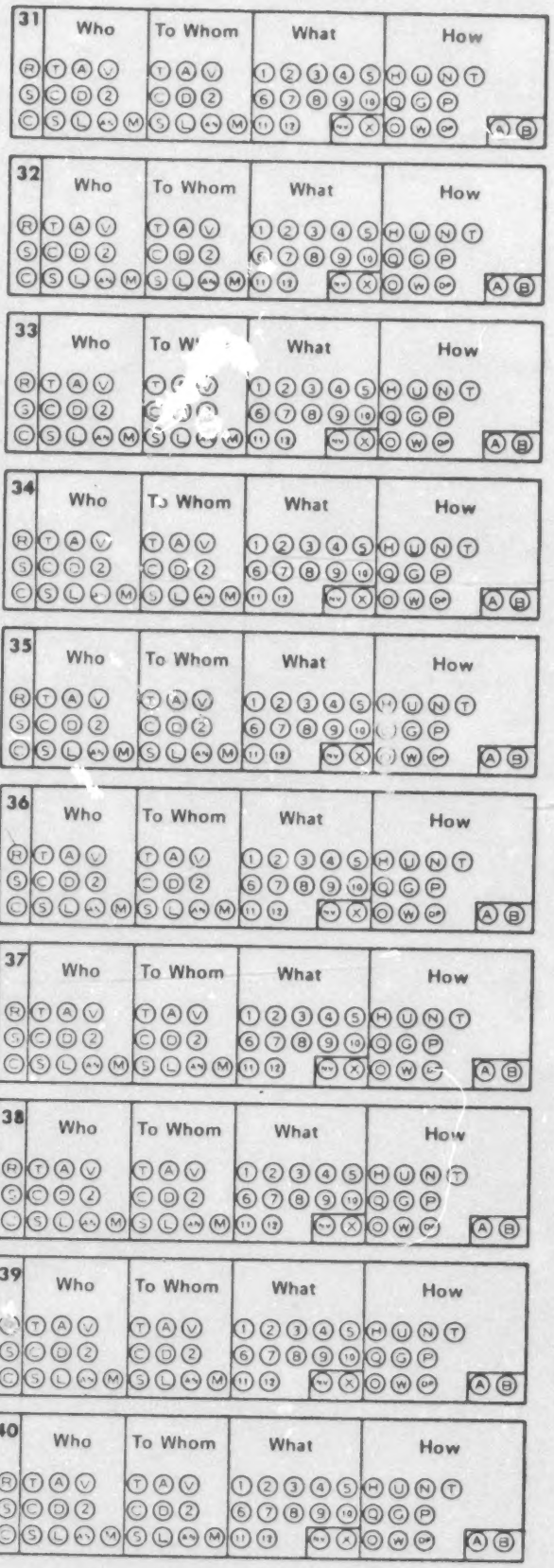
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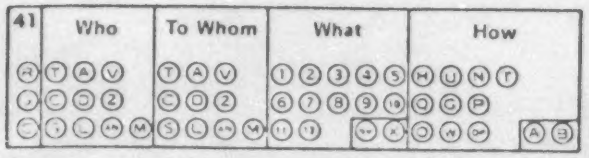
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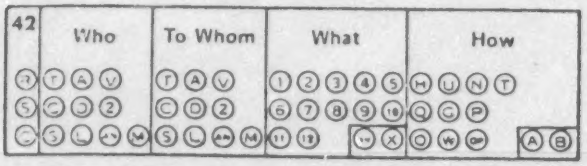
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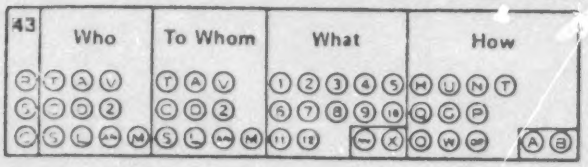
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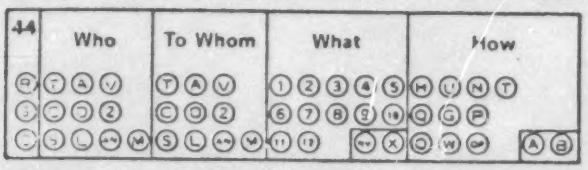
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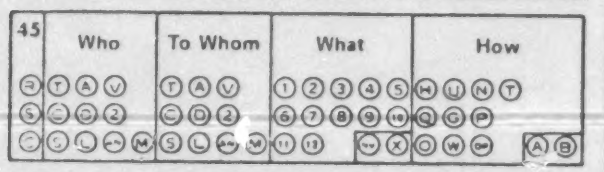
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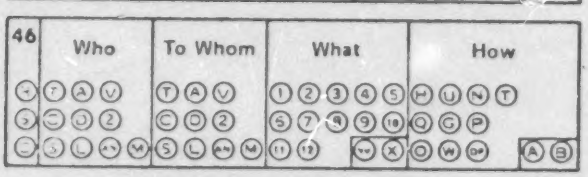
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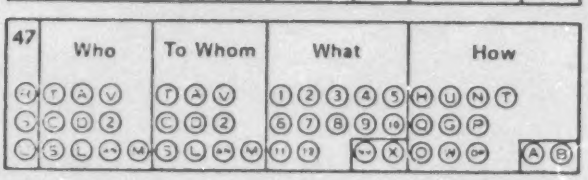
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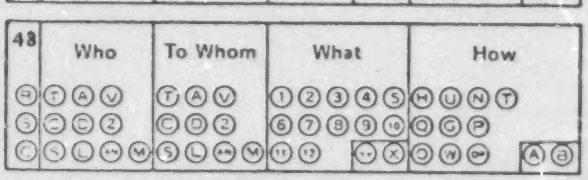
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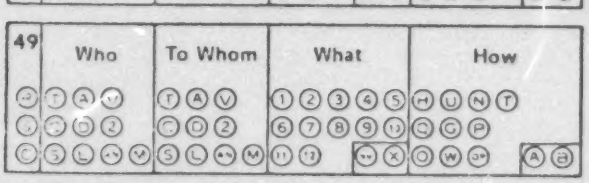
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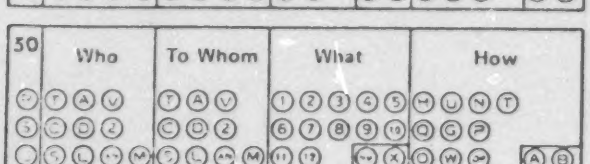
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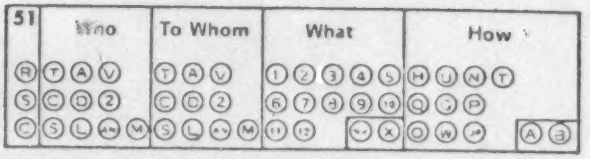
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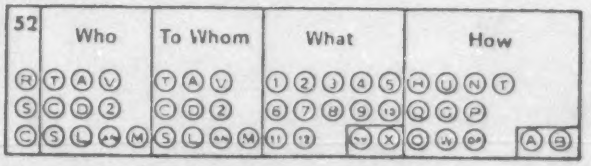
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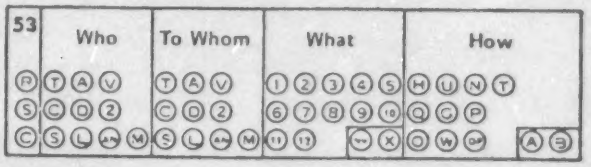
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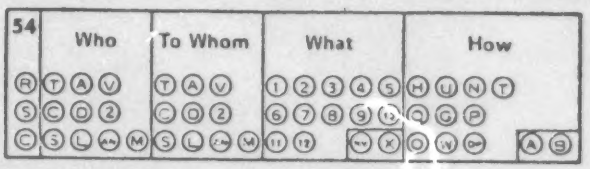
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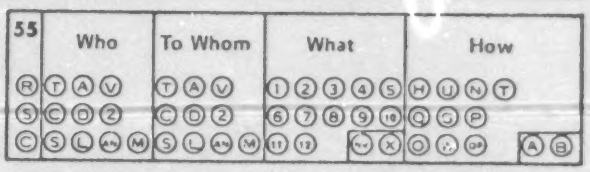
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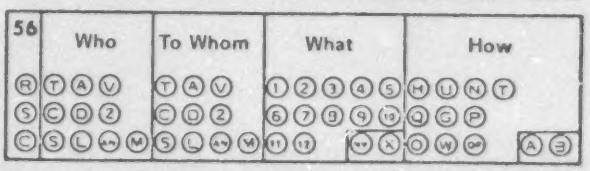
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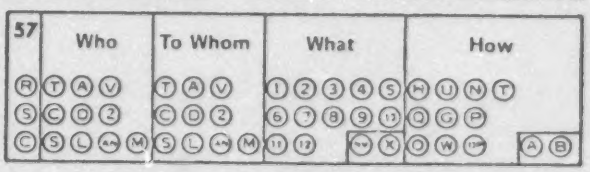
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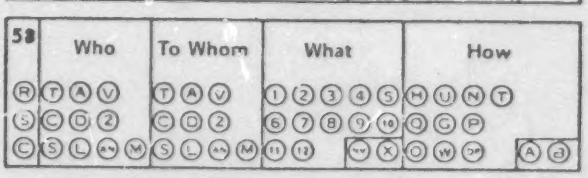
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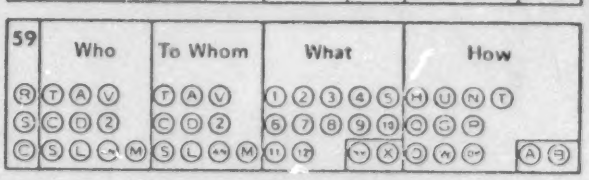
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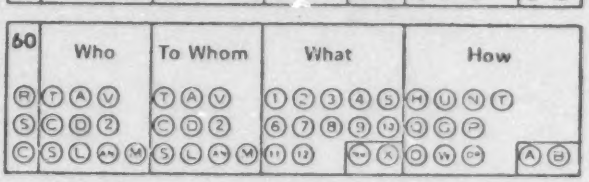
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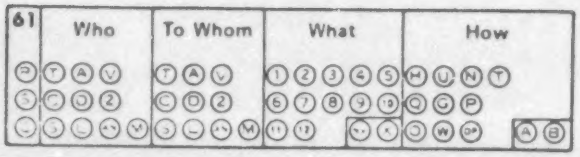
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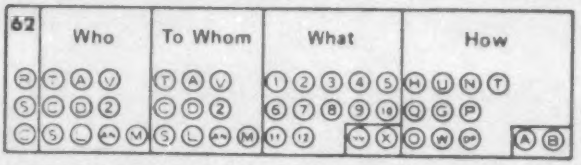
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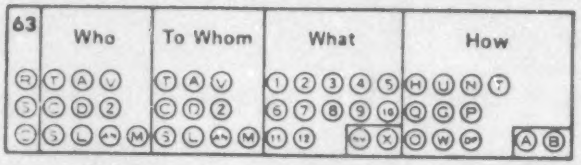
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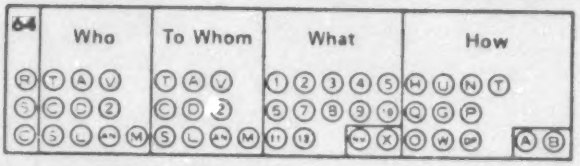
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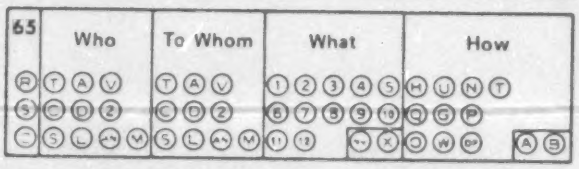
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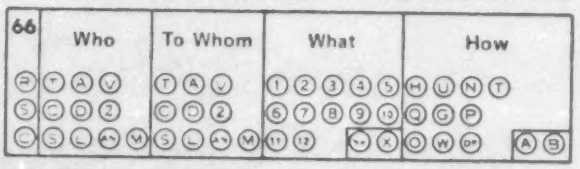
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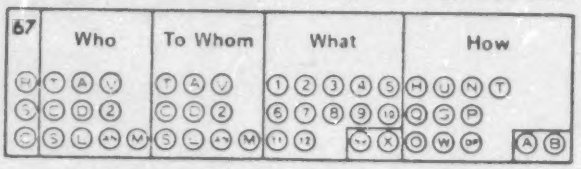
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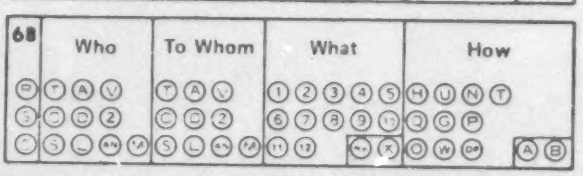
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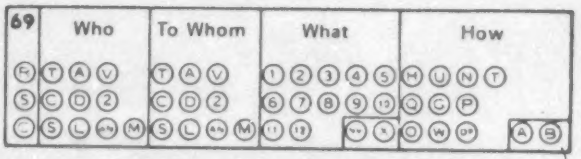
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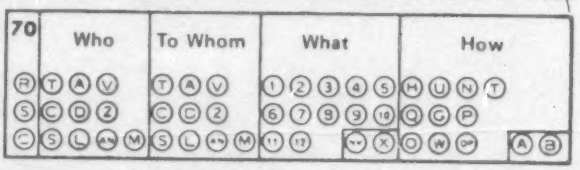
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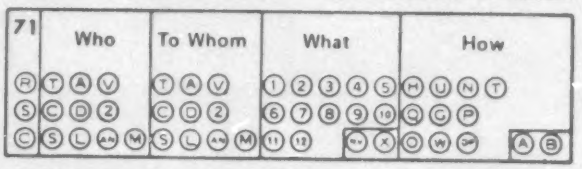
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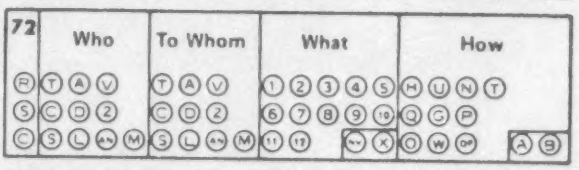
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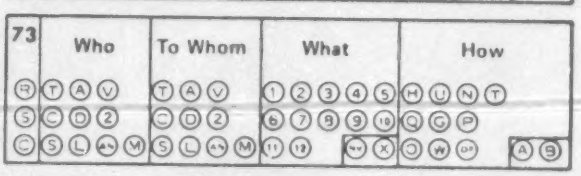
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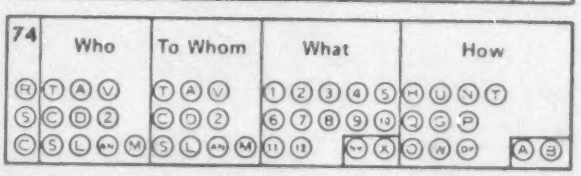
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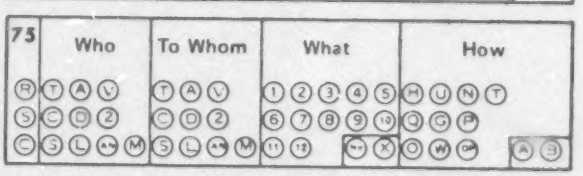
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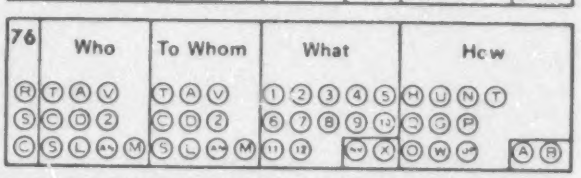
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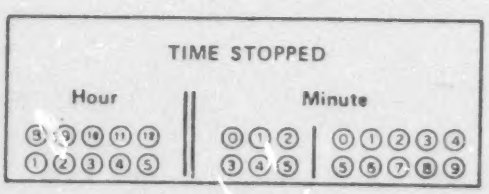
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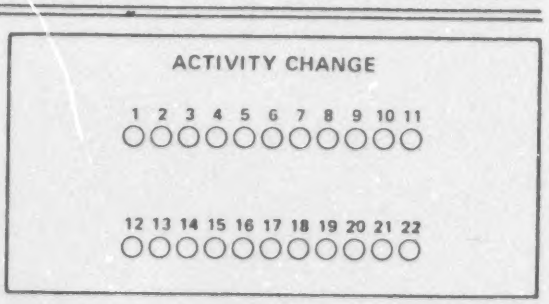
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APPENDIX D. TEACHER INTERVIEW SCHEDULES

TEACHER INTERVIEW SCHEDULE I

School:_____ City/State:_____

Respondent's Name:_____ Interviewer's Name_____

Length of Interview:_____ Date:_____

We need to spend about an hour together now to accomplish two major tasks. First, I need to obtain from you some descriptive information about your classroom and yourself. Second, I need to give you some orientation regarding your role as a "participant-observer" in this study.

Okay, shall we get started?

1. Would you tell me how many students are in your class this year?_____

IA. Do you work with any students besides those in your regular class?

_____No

_____Yes (How Many?): _____

2. Do any other adults spend time in your classroom?

_____No (Skip to Question #3)

_____Yes (Ask Question #2A)

2A. In what capacity (i.e., job title), how often, and for how many hours is this (these) person(s) in the classroom?

Job Title	Times Per Week	Average Number of Hours Per Time
Team Teacher		
Resource Teacher		
Subject Matter Specialist		
Paid Aide		
Volunteer Aide		
Other (specify):		
Other (specify):		

? Do any students from other classes act as tutors for any students in your class?

_____No (Skip to Question #4)

_____Yes (Ask Questions #3A, 3B, 3C, and 3D)

3A. How many of your students receive tutoring from students from other classes?_____

3B. How many tutors are there?_____

3C. How often do they work with your students?_____

3D. How much time on average do they spend working with your students in a single tutorial session?_____

4. Do you have any students in your class who do not speak or understand enough Standard English to be able to deal adequately with instruction given in Standard English?

_____No _____Yes, How many (approximately):
_____

5. Do you know (approximately) how many of your students are "target" compensatory education (e.g., Title I Program) students?

_____Yes (how many?):_____(Can I have a list of their names?)

_____No (Would you find out how many and which students are "target" compensatory education students and report this information to me before I leave today?)

(ASK QUESTIONS #6 AND 7 ONLY AFTER TEACHER HAS PROVIDED A LIST OF THE "TARGET" COMPENSATORY EDUCATION STUDENTS IN THE CLASS.)

6. I'd like to know a little about the circumstances under which your students receive their math (reading) instruction. Do any of your students receive any of their math (reading) instruction in some other place besides your classroom?

Math	Reading	
_____	_____	No (Skip to Question #7)
_____	_____	Yes (Ask Question #6A)

6A. Would you explain how this works? Who gives the instruction? Which students are involved? (Indicate number of compensatory education and non-compensatory education students involved in each out of class situation for math and reading.)

Instructor (Job Title)	Students Involved: Comp. Ed.	Non-Comp. Ed.	How Often
MATH			
READING			

7. Do any of your students receive math (reading) instruction in your classroom?

Math	Reading	
_____	_____	No (Skip to Question #8)
_____	_____	Yes (Ask Question #7A)

7A. Would you explain how this works? Who gives the instruction? Which students are involved? (Indicate number of compensatory education and non-compensatory students who receive math and reading instruction from each instructor.)

Instructor (Job Title)	Students Involved: Comp. Ed.	Non-Comp. Ed.	How Often
MATH			
READING			

8. Now, I'd like to talk to you about your diagnostic activities. For how many of your students did you do diagnosis of their ability, interests, needs, etc., at the beginning of the year?

_____ (1) None

_____ (2) Some (Why these students?) _____

_____

_____ (3) Most (Why not the other students?) _____

_____

_____ (4) All

9. What about at other times during the year, do you do diagnosis of student ability, interests, needs, etc.?

_____ (1) No

_____ (2) Yes For how many of the students? _____

How often (on average)? _____

(ONLY IF AT LEAST SOME OF THE STUDENTS ARE EVER DIAGNOSED, ASK QUESTIONS 10A, 10B, AND 10C.)

10A. What kind of information are you interested in finding out through your diagnostic activities? (Check as many of the following as are mentioned by the respondent. PROBE: "Is there any other kind of information you obtain through diagnosis?")

_____ reading ability (general)	_____ need for approval/reward
_____ reading skills (specific)	_____ interests (likes/dislikes)
_____ math ability (general)	_____ frustration level
_____ math skills (specific)	_____ need for peer interaction
_____ preference for physical work setting	_____ need for teacher direction
_____ other (specify): _____	_____ other (specify): _____
_____	_____
_____	_____
_____ other (specify): _____	_____ other (specify): _____
_____	_____
_____	_____

10B. (HAND LIST OF POSSIBLE RESPONSES TO RESPONDENT) Of the following sources or procedures that you USE in diagnosing students, which do you consider the most (next most etc.) important in providing you with useful information about students?

(RANK in order of importance all the following that apply; "1" equals the source or procedure the teacher sees as providing the most important information.)

____ previous grades achieved

____ standardized test scores

____ standardized sub-test scores

____ single-item analyses from standardized tests

____ Student health records

____ teacher devised formal, written tests

____ teacher devised formal, orally administered tests

____ commercial program written tests or diagnostic instruments

____ previous teachers written comments in student folder

____ previous teachers oral comments from conversation

____ instructional group level from previous year

____ informal observation of student in classroom

____ informal observation of student outside classroom

____ informal oral questioning of student

____ conferences with student's parents

____ other (specify): _____

_____

____ other (specify): _____

_____

10C. How often do you use the information that you obtain from diagnostic activities? (READ EACH STATEMENT. Codes: A = always, U = usually, O = often, S = sometimes, R = rarely, N = never.)

____ (1) to assign students to instructional groups?

____ (2) to prescribe objectives and learning activities for the entire class?

____ (3) to provide myself or others with an explanation of why students are performing as they do?

____ (4) to provide information to others when making a recommendation concerning the student (e.g., change of class, repeat grade, etc.)?

____ (5) to prescribe objectives and learning activities for individual students?

____ (6) other (specify): _____

_____

_____

_____

_____

_____

Now I'd like to ask you some questions about you and your educational and professional background.

11. (Check one): ____ female ____ male

12. What is your age? _____

13. Of which ethnic group do you consider yourself a member?

____ (1) White (European origin)

____ (2) Black

____ (3) Mexican American (Chicano)

____ (4) Puerto Rican

____ (5) other Spanish origin (specify): _____

____ (6) American Indian (Native American)

____ (7) Japanese

____ (8) Chinese

____ (9) other Asian origin (specify): _____

____ (10) other (specify): _____

14. Do you speak any other language besides Standard English?

____ No (Skip to Question #15)

____ Yes (Ask Question #14A and 14B)

14A. Which one(s)? _____

_____

14B. Do you use this (any of these) language(s) in your teaching?

____ No

____ Yes (Which one(s)?): _____

_____

15. How much formal education did your father(mother) have?

Father	Mother	
_____	_____	(1) some grade school
_____	_____	(2) finished grade school
_____	_____	(3) some high school
_____	_____	(4) finished high school
_____	_____	(5) some college
_____	_____	(6) finished college
_____	_____	(7) attended graduate school or professional school after college
_____	_____	(8) don't know

16. For how many years have you been teaching? _____

17. For how many years have you been teaching third graders? _____

18. For how many years have you been employed in this school? _____

19. Could you tell me about the college degrees and/or credentials that you have received?

Degrees/Credentials	Subject Areas

20. Have you acquired any college units beyond your highest earned degree or credential?

____ No

____ Yes (How many units?):_____

21. Have you received any special training in the teaching of reading or mathematics?

____ No

____ Yes (Could you describe this training? How much and of what type of training experience?) _____

_____

_____

THAT COMPLETES THE INTERVIEW. WE NOW NEED TO TALK ABOUT YOUR ROLE AS A "PARTICIPANT-OBSERVER". SHOULD WE TAKE A BREAK NOW OR CONTINUE?

ORIENTATION FOR SETTING UP AND USING THE STUDENT ACTIVITY LOG KIT

As was previously explained, your participation in this study requires that you act as a "participant-observer", by keeping records of the activity of your students with the Student Activity Log. We think that you as the classroom teacher are best able to record what your students are doing during the period of this study. As you know there will be additional observation done by me (or other outside people), but your observations constitute a large and important part of the data collected in this study.

Before beginning my explanation of the Student Activity Log Kit here (point to materials), I want to stress one important point. Your classroom has been selected for inclusion in this study because of the way you organize it. We have included in the study a great variety of differently organized classrooms. We have not prejudged which type of classroom instructional program is most effective, let alone which instructional programs work best for certain types of kids in certain types of schools. The point is that we want you to record what happens in your classroom as objectively as possible. There is no need to try to fit what happens in your classroom in some "ideal" model, because what actually occurs may be more effective than what some people think is ideal. Thus, we want to know what ACTUALLY happens in your classroom.

(SPREAD OUT THE DIFFERENT MATERIALS IN THE STUDY ACTIVITY LOG KIT)
Here are the materials that have been developed to assist you in keeping systematic records of your observations of the activity of students in your classroom. We will go over the instructions together, set up the Student Activity Log, and go over the procedures for using the Log, using some hypothetical examples.

NOTES TO INTERVIEWER

Check to see if all materials have been included in the kit.
MATERIALS IN KIT: Make sure that first "pressure-sensitive" copies are properly clipped to Student Activity Logs. Explain to teacher that this will allow you to collect copies of the Log when you visit the teacher at other times during the year.

STUDENT NAMES: Explain to teacher that the names can be listed in any order that seems to make using the Log the easiest. Teacher may want to postpone filling in the names of students until after the instructions have been completed, so he/she will have a better idea of how names can be most conveniently arranged.

OBJECTIVES: When assisting teacher in identifying from 15-20 instructional objectives for math and reading, explain that objectives can be chosen from the Suggested Lists (see appendices to instructions), as written or with modifications OR the teacher can describe other objectives (BUT they should follow the same format as those on the Suggested Lists).

INSTRUCTIONAL MATERIALS: Explain to teacher that all materials used should be listed for math and reading. It may be best for teacher to delay listing those materials that may not be used, and include them on the Coding Keys' lists only when they have been used.

(AFTER YOU AND TEACHER HAVE GONE OVER THE INSTRUCTION SHEET, PROVIDE SOME EXAMPLES TO TEST WHETHER TEACHER UNDERSTANDS CODING SYSTEM AND SYMBOLS)

Do you have any further questions about the use of the Student Activity Log Kit? Any questions about other aspects of the study? Please feel free to write or call my office if a question arises. Thank you again for your time and cooperation. I'll see you in about one month, at which time we can briefly review how the Log keeping operation is going.

TEACHER INTERVIEW SCHEDULE II

School:_____ City:_____

Respondent's Name:_____ State:_____

Interviewer's Name:_____

Length of Interview:_____ Date:_____

We need to do two things as part of this final interview of the study. I'd like to ask some general questions about your experiences in this school. Then, we need to finalize your role as "participant-observer."

1. First, since this study is concerned primarily with math and reading, could you tell me how many hours per week (approximately) do the students in your class spend on these subjects directly?

   a. Math_____hours b. Reading_____hours

2. Are there subjects which you consider to be related to reading on which your students receive instruction?

   _____ (1) No

   _____ (2) Yes. How many hours per week (approximately) do you students spend on these subjects?

   _____

3. Are there subjects which you consider to be related to math?

   _____ (1) No

   _____ (2) Yes. How many hours per week (approximately) do you students spend on these subjects?

   _____

4. Moving on to another topic, is there any time during the school day that is specifically set aside for you to do instructional planning? That is, is there any time during which you are released from the responsibility of supervising students to do your instructional planning?

   _____ No (Skip to Question #5)

   _____ Yes (Ask Questions #4A and 4B)

4A. How often is such time provided?

_____ daily

_____ a few times a week

_____ once a week

_____ less often (specify):_____

4B. How much time is usually provided for each planning period?

_____ hours

5. During the last two years have there been any inservices organized by this school or school district?

_____ No (Skip to Question #6)

_____ Yes (Ask Question #5A)

5A. Have any of these inservices focused on the issue of individualization of instruction?

_____ No (Skip to Question #6)

_____ Yes (Continue with Questions #5B and 5C)

5B. How many such sessions have been offered?_____

5C. How many of these have you attended?_____

6. In thinking about the way you've organized your class for instructional purposes this year, is it fairly similar to the way you did it last year, or have you instituted major changes?

_____ (1) same as last year (for how many years have you been organizing your class in this way?):
_____years

_____ (2) somewhat different then last year (could you tell me how it is different?):_____
_____
_____
_____

_____ (3) very different from last year (would you tell me how it is different?): _____

_____

_____

7. Have any of the parents of students in your class reacted POSITIVELY or NEGATIVELY in the way you have organized your class for instructional purposes this year?

_____ No (Skip to Question #8)

_____ Yes (Ask Questions #7A and 7B)

7A. How many reacted negatively? _____

7B. How many reacted positively _____

8. Moving on to another issue, how often do you communicate to parents in writing about the progress of their children? _____

(IF TEACHER EVER COMMUNICATES TO PARENTS IN WRITING, ASK) Can I have a copy of the form (s) you use for this purpose?

_____ (1) Yes (obtain a copy)

_____ (2) No (Why not?): _____

_____

_____

9. How often do you meet with parents to discuss the progress of their children?

_____

9A. (IF TEACHER EVER MEETS WITH PARENTS, ASK) What kinds of things are generally discussed?

_____

_____

_____

_____

_____

Now I would like to ask you a few questions about how decisions about curricular matters are made in this schools?

10. Do any parents or other community people participate in this decision making process? (If Yes) How many (approximately)?

_____ (1) none (Skip to Question #11)
_____ (2) just a few ----------
_____ (3) many of them ----------
_____ (4) almost all of them -------

ASK QUESTION #10A

10A. What is their role?

_____ (1) able to make final decisions

_____ (2) share authority for final decision making with administrators, teachers, etc.

_____ (3) serve in an advisory capacity to administrators, teachers, etc.

_____ (4) participate, but only in an observer role

11. What about teachers in this school and how many of them participate in making decisions about curricular matters?

_____ (1) none (Go to "Debriefing Session)
_____ (2) just a few ----------
_____ (3) many of them ----------
_____ (4) almost all of them ------

ASK QUESTION # 11A

11A. What is their role?

_____ (1) able to make final decisions

_____ (2) share authority for final decision making with other groups

_____ (3) serve in an advisory capacity to other groups

_____ (4) participate, but only in an observer role

STUDENT ACTIVITY LOG DEBRIEFING SESSION

Now I'd like to talk with you about the Student Activity Log that you have been using to record your "observations" of your classroom. You might think of this as a "debriefing" session.

First, let me thank you again for your help in providing this information. As I mentioned before, this part of the data collection process is extremely important to the entire study. Therefore, we want to make sure that the information provided is complete as possible.

INTERVIEWER: Briefly look over the Student Activity Logs, checking to see that:

1) all cells in the Log have some marking on them, either dates and codes, or the words, "after," "before," or "not relevant;"

2) a beginning and ending date have been entered for all relevant cells on the Logs;

3) the number of hours on task have been entered for each relevant cell;

4) at least one code for Materials, Physical Setting, Social Setting, Teacher Behavior, and Student Behavior, have been entered in each relevant cell. (Remember there is a specific code to indicate if no teacher was present, nor peers were present, no teacher behavior was involved, or no materials were used);

5) all codes entered on the Logs have a referent on the Coding Keys. (In the case of Physical Setting, Social Setting, Teacher Behavior, and Student Behavior, there is a given fixed number of codes, while in the case of Materials there can be a variable number, however descriptions for each code should be entered on the Coding Key);

6) the number of objectives on the Logs matches the number of descriptions of objectives listed on the Coding Keys; and

7) all codes and descriptions are legible.

Any problems or discrepancies should be discussed with the teacher and rectified.

Okay, now I'd like to ask you a few questions concerning the activity that you have observed and coded on the Student Activity Logs.

12. Can you tell me how the math (reading) objectives for each student are determined? (IF THERE ARE ANY CELLS THAT ARE MARKED "NOT RELEVANT," ASK, How do you determine that some objectives are "not relevant" for certain students? (Check one for both math and reading.)

Math	Reading	
_____	_____	(1) Prior to start of year, administrators or teachers prescribe the set of objectives that the class (grade level) will work on.
_____	_____	(2) Instructional [illegible] or commercial programs provide a set of objectives that are applied to students using them.
_____	_____	(3) Students decide (via a vote, etc.) the set of objectives to be worked on by the class.
_____	_____	(4) Teacher diagnoses students and prescribes the set of objectives that the class will work on.
_____	_____	(5) Teacher diagnoses students and assigns them to instructional group for which a set of objectives is prescribed (group sizes): _____
_____	_____	(6) Individual students choose the objectives that they will work on.
_____	_____	(7) Teacher and student negotiate a "contract," specifying the set of objectives to be worked on.
_____	_____	(8) Teacher diagnoses students and prescribes which objectives they should work on as individuals.
_____	_____	(9) Other (specify): _____

13. How is the sequence of working on math (reading) objectives determined? (IF IT APPEARS THAT AT LEAST SOME STUDENTS WORK ON OBJECTIVES IN DIFFERENT SEQUENCES, ASK, Why do some students work on math (reading) objectives in a different order? (Check one for both math and reading.)

Math	Reading		
_____	_____	(1)	Sequence is determined by subject matter, instructional materials or teachers' and administrators' decisions prior to the beginning of the year.
_____	_____	(2)	Students decide (via a vote, etc.) the sequence on which the objectives will be worked by the class as a whole.
_____	_____	(3)	Teacher diagnoses students and prescribes the sequence on which objectives will be worked for the entire class.
_____	_____	(4)	Teacher diagnoses students and assigns them to an instructional group for which the sequence of objectives is determined (group sizes): _____.
_____	_____	(5)	Individual students choose the sequence on which they will work on objectives.
_____	_____	(6)	Teacher and student negotiate "contract" specifying the sequence for working on objectives.
_____	_____	(7)	Teacher diagnoses students and prescribes the sequence on which objectives will be worked on.
____	_____	(8)	Other (specify): _____.

_____

_____

_____

14. What determines the amount of time that students spend working on particular math (reading objectives? (LOOK DOWN SEVERAL OF THE COLUMNS OF THE LOGS--IF THE NUMBER OF HOURS THAT STUDENTS SPEND ON GIVEN OBJECTIVES VARIES, ASK, Why do some students spend more or less time working on some math (reading) objectives? (Check one for both math and reading.)

Math	Reading		
_____	_____	(1)	Time allotted is determined by instructional materials and/or teacher/administrator decision prior to beginning of the school year.
_____	_____	(2)	Student decides (via a vote, etc.) the amount of time that the class will spend in working on particular objectives.
_____	_____	(3)	Teacher diagnoses students and prescribes how much time the class will spend working on particular objectives.
_____	_____	(4)	Teacher diagnoses students, etc. and assigns them to an instructional group which the length of time spent in working on given objectives is determined.
_____	_____	(5)	Individual students work on particular objectives until they have completed them.
_____	_____	(6)	Teacher diagnoses students and allots time for working on particular objectives accordingly.
_____	_____	(7)	Other (specify): _____

_____

_____

_____

15. How are instructional materials selected for students who are working on particular math (reading) objectives? (LOOK DOWN COLUMNS OF LOGS--IF THE MATERIALS USED BY STUDENTS SEEM TO VARY, ASK, Why do students use different materials when working on particular math (reading) objectives? (Check one for both math and reading.)

Math	Reading		
_____	_____	(1)	Materials determined by teacher and/or administrator decision prior to beginning of school year.
_____	_____	(2)	Students decide (via a vote, etc.) which materials will be used when working on particular objectives.
_____	_____	(3)	Teacher diagnoses students and selects the materials to be used commonly by the entire class.
_____	_____	(4)	Teacher diagnoses students and assigns them to instructional groups for which instructional materials are selected.
_____	_____	(5)	Individual students choose the materials they will use when working on particular objectives.
_____	_____	(6)	Teacher and student negotiate "contract" specifying the materials to be used when working given objectives.
_____	_____	(7)	Teacher diagnoses students and prescribes for individuals which materials will be used accordingly.
_____	_____	(8)	Other (specify): _____

_____

_____

_____

16. Thinking about the teacher behavior categories that you have used for coding the logs, how do you determine which type of teacher behavior to use when dealing with students working on particular math (reading) objectives? (LOOK DOWN COLUMNS OF LOGS--IF THE TEACHER BEHAVIORS SEEM TO VARY, ASK, Why do some students receive different kinds of teacher behavior when they are working on particular math (reading) objectives? (Check one for both math and reading.)

Math	Reading		
_____	_____	(1)	Teacher has developed with experience the best things to do with all students who are working on particular objectives.
_____	_____	(2)	Students decide (via a vote, etc.) what kinds of things the teacher should do in working with the entire class.
_____	_____	(3)	Teacher diagnoses students and decides what would be the best things to do when working with the entire class.
_____	_____	(4)	Teacher diagnoses students and assigns them to instructional groups for which the things that the teacher does in working with students is determined.
_____	_____	(5)	Individual students determine (by asking) what the teacher does in working with them.
_____	_____	(6)	Teacher and student negotiate "contract" specifying the things that the teacher should do in working with the student on particular objectives.
_____	_____	(7)	Teacher diagnoses students and determines the best things to do with each student who is working on particular objectives.
_____	_____	(8)	Other (specify): _____

_____

_____

_____

17. Thinking now about the physical setting categories that you used for coding the logs, how is the physical setting determined for students working on particular math (reading) objectives? (LOOK DOWN COLUMNS OF LOGS--IF STUDENTS APPEAR TO WORK IN DIFFERENT SETTINGS FOR GIVEN OBJECTIVES, ASK, Why do some students work in different physical settings while proceeding through particular math (reading) objectives? (Check one for both math and reading.)

Math	Reading		
_____	_____	(1)	Limited facilities, school regulations, or subject matter determine where students work.
_____	_____	(2)	Students decide (via a vote, etc.) where the entire class or group will work on particular objectives.
_____	_____	(3)	Teacher diagnoses students and determines where the entire class will work on particular objectives.
_____	_____	(4)	Teacher diagnoses students and assigns them to an instructional group for which the setting is determined.
_____	_____	(5)	Individual students choose where they will work on particular objectives.
_____	_____	(6)	Teacher and student negotiate "contract" specifying where particular objectives will be worked on.
_____	_____	(7)	Teacher diagnoses students and prescribes for individuals where they will work on particular objectives.
_____	_____	(8)	Other (specify): _____

_____

_____

_____

18. Thinking now about the pupil behavior categories you used for coding the logs, how do you determine who works together (both students and instructors) while proceeding through particular math (reading) objectives? (LOOK DOWN COLUMNS OF LOGS--IF DIFFERENT STUDENTS APPEAR TO WORK IN DIFFERENT SOCIAL SETTING WHILE PROCEEDING THROUGH GIVEN OBJECTIVES, ASK, Why does the social setting vary for students working on particular math (reading) objectives?

Math	Reading		
_____	_____	(1)	All students who are working on a given objective work together.
_____	_____	(2)	Ability groupings determine the other students with whom a student works on particular objectives.
_____	_____	(3)	Ability groupings determine the other students with whom most students work on particular objectives; some students work together because they like each other or because teacher thinks they work well together.
_____	_____	(4)	All students choose who they will work with on particular objectives.
_____	_____	(5)	Teacher diagnoses students and decides on the basis of something other than ability who is grouped together to work on particular objectives.
_____	_____	(6)	Other (specify): _____

_____

_____

_____

19. Now, thinking about the pupil behavior categories used for coding the logs, how do you determine what kind of things students do when working on particular math (reading) objectives? (LOOK DOWN COLUMNS OF LOGS--IF STUDENTS APPEAR TO HAVE DIFFERENT PUPIL BEHAVIORS ASSOCIATED WITH GIVEN OBJECTIVES, ASK, Why do some students do different things in working on particular math (reading) objectives?

Math	Reading		
_____	_____	(1)	Activity determined by materials or teacher and/or administrator decision prior to start of year.
_____	_____	(2)	Students decide (via a vote, etc.) what activities the class will do when working on given objectives.
_____	_____	(3)	Teacher diagnoses students and prescribes the activities that the entire class will engage in together.
_____	_____	(4)	Teacher diagnoses students and assigns them to an instructional group for which the type of activity to be done while working on given objectives is prescribed.
_____	_____	(5)	Individual students choose the type of activity to be done in working on given objectives.
_____	_____	(6)	Teacher and student negotiate "contract" specifying the type of activity to be done in working on particular objectives.
_____	_____	(7)	Teacher diagnoses students and prescribes for individuals the type of activity to be done in working on particular objectives.
_____	_____	(8)	Other (specify): _____

_____

_____

_____

I would like to ask you a few questions now about your reactions to the Student Activity Log.

20. Would you say that having to keep the log helped you, hampered you, or had no effect on your teaching?

____ (1) helped me

____ (2) hampered me

____ (3) had no effect

20A. Why do you say this? _____

_____

_____

_____

_____

21. Do you think other teachers might profit from keeping similar logs for their classrooms?

_____ (1) YES, a lot

_____ (2) YES, somewhat

_____ (3) Perhaps, not necessarily, or it depends

_____ (4) NO, not really

_____ (5) NO, definitely not

22. Finally, for each name listed on the Student Activity Log for Math would you please indicate the number of 1) <u>total number of days absent</u> and 2) the number of days of <u>excused absences</u> for each student for the current school year. Write these two numbers, separated by a slash mark (i.e., total number of days absent/ number of days of excused absences), below each student's name on the Student Activity Log for Math.

That is the end of the final interview.

ON BEHALF OF MYSELF AND THE ENTIRE RESEARCH TEAM, I WOULD LIKE TO EXPRESS A SINCERE THANK YOU FOR ALL YOUR TIME AND EFFORT. You really have made this study possible and have rendered an invaluable service. Do you have any final questions or comments? Thank you again for your cooperation in this important study.

APPENDIX E. PRINCIPAL QUESTIONNAIRE

PRINCIPAL QUESTIONNAIRE

Name:_____ Date:_____

School Name:_____ City:_____

School Address:_____ State:_____ Zip_____

School Phone: ( )_____

1. How long have you been principal of this school?_____

2. What is your school enrollment?_____

3. What is the district enrollment (K-12)?_____

4. What is the total cost of your instructional program (excluding transportation and food services)?

$_____

5. Please indicate in the chart below, the amount of compensatory education funds that your school receives through various federal and state programs.

Funding Source	Amount in Dollars

6. Please indicate in the following chart, the total number of each category of personnel (including yourself) at your school.

6A. Also, please indicate how many in each category receive some or all of their salary from and compensatory education funds.

Category	Total Number	Number receiving at least part of their salary from Comp. Ed. Funds
Administration		
Teacher		
Aide		
Specialist		
Counseling and Guidance Personnel		
Support Staff		
Other (Specify):		

7. In different schools various criteria are used for assigning students to specific classes. What is the most important criterion that is used for assigning students to classes in your school? (Circle the appropriate number.)

1. age of student
2. achievement level of student
3. personality characteristics of teacher and students
4. random assignment
5. other (please specify): _____

_____

8. Is your school currently involved in a court-ordered racial intergration program? (Circle the appropriate number.)

1. No (please skip to question #9)
2. Yes (please answer question #8A)

8A. Is this a current source of conflict in the community? (Circle the appropriate number.)

1. No
2. Yes

9. Please rank the following groups of people in terms of their level of participation in making final decisions about curricular matters for your school. (1 = highest rank)

____1. school board members

____2. school district administrators

____3. you as principal (and your assistant principal (s))

____4. teachers

____5. parents and other community members

____6. other (please specify):_____

10. How many parents or other community people participate in this decision making process? (If Yes) How many (approximately)?

_____(1) none (Please skip to Question #11)

_____(2) just a few----------

_____(3) many of them ----------

_____(4) almost all of them------

PLEASE ANSWER QUESTION #10A

10A. What is their role?

_____(1) able to make final decisions

_____(2) share authority for final decision making with administrators, teachers. etc.

_____(3) serve in an advisory capacity to administrators, teachers, etc.

_____(4) participate, but only in an observer role.

11. What about teachers in this school and how many of them participate in making decisions about curricular matters?

_____(1) none (Go to Question #12)

_____(2) just a few ----------

_____(3) many of them ----------

_____(4) almost all of them -------

PLEASE ANSWER QUESTION #11A

11A. What is their role?

_____(1) able to make final decisions

_____(2) share authority for final decision making with other groups

_____(3) serve in an advisory capacity to other groups

_____(4) participate, but only in an observer role

12. In general, how supportive of your school are most of the parents in this community? (Circle the appropriate number.)

1. extremely
2. moderately
3. slightly
4. not at all

Thank you very much for your time and cooperation.

APPENDIX F. STUDENT ACTIVITY LOG

A. INSTRUCTIONS FOR USING THE STUDENT ACTIVITY LOG KIT

Introduction

The Student Activity Log Kit has been devised to assist you in performing your role as participant-observer in this study. After familiarizing yourself with the materials in the kit and setting up the Student Activity Log, you should find it relatively easy to systematically record the instructional activities in which your students engage.

Materials Included in the Kit

In addition to the Instructions for Using the Student Activity Log Kit, there are four kinds of materials in this kit: 1) Student Activity Log--Math, 2) Student Activity Log--Reading, 3) Coding Key for Student Activity Log--Math, 4) Coding Key for Student Activity Log--Reading, 5) Suggested Objectives for Math, and 6) Suggested Objectives for Reading.

Students' Names

The name of every student in your class should be entered along the left side of the Student Activity Log--Math and similarly, along the left side of the Student Activity Log--Reading. In listing the names several strategies can be followed. For example, if students tend to be grouped for instruction in the subject the names can be entered reflecting these groupings (alphabetized within groups). Otherwise, students' names can be listed in alphabetical order, or in the way that you find them easiest to reference. The names of new students should be listed when they enter the class (with the date entered) given in parentheses. The names of students who permanently leave your class should be "crossed-out".

Instructional Objectives--Math

Using the Coding Key for the Student Activity Log--Math, you should list between 15 and 20 instructional objectives that will probably be worked on by one or more of your students during the first semester of this school year. A suggestive list of instructional objectives for math is provided in the next section. If you find any of these objectives to be relevant to your class, then they can be listed on the coding key. If the suggestive list does not provide the necessary 15-20 instructional objectives, then you can generate your own. The ones you generate should follow the same pattern as those on the suggested list. That is, the objectives should pertain to behavior--what a student will do--and the objectives should deal with instruction that might normally take between 1 and 2 weeks to complete. (The field staff member can give you a more detailed explanation and assist you in describing objectives in this fashion. There are obviously other ways to describe objectives, however to provide some degree of uniformity in the study, all teachers are being asked to describe THEIR objectives in this manner).

Descriptors for Instructional Objectives--Math

For each instructional objective listed on the Coding Key for the Student Activity Log (see instructions above) a one or two word descriptor should be created and written next to the description of the instructional objective on the Coding Sheet For the Student Activity Log. ALSO, these descriptors should be entered across the top of the Student Activity Log (one descriptor per column) in the same order as they appear on the Coding Key.

Instructional Objectives--Reading

The same procedure should be followed in generating 15-20 objectives for reading as was followed for the math objectives. A list of suggestive instructional objectives is provided (in the next section) and the field staff member will assist you. The objectives for reading should be listed on the Coding Key for the Student Activity Log--Reading.

Descriptors for Instructional Objectives--Reading

As in the case of math objectives, one or two word descriptors should be created for each reading objectives. These descriptors should be entered next to each objective description on the Coding Key for the Student Activity Log--Reading as well as being entered across the top of the Student Activity Log--Reading (one descriptor per column) in the same order as they appear on the Coding Key.

Instructional Materials--Math

The names of specific instructional materials for math (e.g., textbooks, workbooks, mimeographed work sheets, manipulatives, etc.) should be listed on the Coding Key for the Student Activity Log--Math. Additions to this list should be made at any time during the study when new materials are acquired. This list of materials will be used on the Student Activity Log--Math to code what materials students use when working on given objectives. Notice that the "M40" code has been designated to signify that no instructional materials were used.

Instructional Materials--Reading

Similarly, the names of specific instructional materials for reading (readers, free-reading books, workbooks, audio-visual equipment, etc.) should be listed on the Coding Key for Student Activity Log--Reading. Additions to this list should be made at any time during the study when new materials are acquired. This list of materials will be used to code on the Student Activity Log--Reading what materials students use when working on given objectives. Notice that the "M40" code has been designated to signify that no instructional materials were used.

THE FOLLOWING INSTRUCTIONS APPLY TO BOTH MATH AND READING STUDENT ACTIVITY LOGS.

Using the Student Activity Log

Several kinds of information are recorded on the student activity log: 1) beginning date, 2) ending date, 3) number of hours on task,

and codes for 4) materials, 5) physical setting, 6) social setting, 7) teacher behavior, and pupil behavior.

Beginning Date

Whenever one or more students in your class starts work on an instructional objective, the beginning date (e.g., "10/5" for October 5th) should be entered in the upper left hand corner of the appropriate cell(s) on the Student Activity Log for Math or Reading.

Ending Date

Whenever one or more students in your class stops working on an instructional objective (either as a result of completing the objective or because he cannot or will not be completed for an indefinite period, the ending date (e.g., "10/20" for October 20th) should be entered in the upper middle section of the appropriate cell(s) on the Student Activity Log for Math or Reading.

Number of Hours on Task

Whenever one or more students stops working on an objective, the approximate number of hours that the student(s) has (have) spent working on the objective should be entered in the upper right hand corner of the appropriate cell(s) on the Student Activity Log for Math or Reading. IT IS A GOOD IDEA TO USE "HASH MARKS" (i.e., /, //) to indicate the number of hours worked on the particular objective by given students EVERY DAY. (It is important to make an accurate estimate of the number of hours that students actually are engaged on a specific objective, because beginning and ending dates do not really indicate how much time students spend working on instructional objectives.

Code for Materials

For each student working on an instructional objective, the letter number code for any materials that students use should be entered in the appropriate cell on the Student Activity Log for Math or Reading. This may involve entering one or more codes, depending on the number

of different materials that are used. EACH LETTER - NUMBER CODE SHOULD BE CIRCLED, to ensure that they can be distinguished.

Code for Physical Setting

For each student working on an instructional objective the letter-number code associated with any physical setting in which the student works should be entered in the appropriate cell of the Student Activity Log for MATH or READING. This may involve entering several codes in one cell. Allowable codes and descriptions of the physical setting associated with each code are listed in the Coding Keys. EACH LETTER-NUMBER CODE ENTERED ON THE LOGS SHOULD BE ENCIRCLED, to ensure that they can be easily distinguished.

Code for Social Setting

For each student working on an instructional objective the letter-number code associated with any social setting in which the student works (i.e., with whom the student(s) work) should be entered in the appropriate cell(s) of the Student Activity Log for MATH or READING. This may involve entering several codes in one cell. Allowable codes and descriptions of special settings associated with each code are listed in the Coding Keys. EACH LETTER-NUMBER CODE entered on the Logs SHOULD BE ENCIRCLED, to ensure that they can be easily distinguished.

Code for Teacher Behavior

For each student working on an instructional objective the letter-number code associated with any teacher behavior that is involved in the student instruction should be entered in the appropriate cell(s) of the Student Activity Log for MATH or READING. This may involve entering several codes in one cell. Allowable codes and descriptions of teacher behavior associated with each code are listed in the Coding Keys. EACH LETTER-NUMBER CODE entered on the Logs SHOULD BE ENCIRCLED, to ensure that they can be easily distinguished.

Code for Pupil Behavior

For each student working on an instructional objective the letter-number code associated with any behavior that the student engages in while working on the objective should be entered in the appropriate cell(s) of the Student Activity Logs for MATH or READING. This may involve entering several codes in one cell. Allowable codes and descriptions of pupil behavior associated with each code are listed in the Coding Keys. EACH LETTER-NUMBER CODE entered on the logs SHOULD BE ENCIRCLED, to ensure that they can be easily distinguished.

Weekly Reports to the Data Collection Field Supervisor

Every Friday a copy of the Student Activity Log--Math and a copy of the Student Activity Log--Reading should be mailed to the Data Collection Field Supervisor using the postage paid, previously addressed envelopes. A new copy form should be attached behind the Student Activity Logs for both Math and Reading to allow copies to be made of the following weeks activities. (Should you have any questions or comments for the Data Collection Field Supervisor, they should be enclosed on a separate peice of paper in the same envelope. The Data Collection Field Supervisor will contact you as soon as possible to respond to your questions or comments). If you happen to forget to mail the copy forms on Friday, please do so as soon as possible thereafter. If the Data Collection Field Supervisor has not received a weeks copy form before Tuesday of the following week, you will be contacted by phone so that the copy can be obtained for the research project.

Completing the Log at the End of the Study

At the completion of the study, there may be a number of cells for one of more students that remain empty. There are several reasons why these cells have not been used:

1) If the instructional objective was completed by the student(s) prior to the beginning of the study, write the word, "BEFORE," in the appropriate cell(s);

2) If work on instructional objectives has not been started by the end of the study period, but will probably take place during this school year, write the word, "AFTER," in the appropriate cell(s);

3) A last reason for cells remaining blank is because the particular objective doesn't apply or is not relevant to a particular student or group of students (i.e., the student has not and will not work on the objective this year). If this is not the case, then write the words, "NOT RELEVANT" in the appropriate cell(s).

At this point, each cell in the Log should be filled with some notation. (If there are still empty cells, you should discuss this with your field staff member, when he/she picks up the Log during the final school visitation).

Conclusions

Your diligence in following the above instructions is of utmost importance to the success of this research project. As a paid member of the research team, it is hoped that you will carry out your responsibilities with extreme care and promptness. If you should have any questions about how the Student Activity Log Kit should be used, please contact your assigned field staff member as soon as possible by telephone at: _____.

B. Materials Associated With the Log

Student Name	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	Objective 7	Objective 8	Objective 9	Obj

CTIVITY LOG FOR MATH

ve	Objective 10	Objective 11	Objective 12	Objective 13	Objective 14	Objective 15	Objective 16	Objective 17	Objective 18	Objective 19	Objective 20

Student Name	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	Objective 7	Objective 8	Objective 9	O

VITY LOG FOR READING

ve	Objective 10	Objective 11	Objective 12	Objective 13	Objective 14	Objective 15	Objective 16	Objective 17	Objective 18	Objective 19	Objective 20

CODING KEY FOR STUDENT ACTIVITY LOG--MATH

Teacher Behavior
(What Teacher, Aid, etc. Does)

T1. makes oral presentation

T2. gives demonstration (shows and tells)

T3. facilitates discussion

T4. tutors

T5. not actively involved (students work without instructor)

Social Setting
(With Whom Student Works)

S1. regular classroom

S2. math specialist

S3. paid aide

S4. volunteer aide

S5. other adult

S6. no adult

S7. older student tutor (from another class)

S8. entire class of peers (comp. ed. only)

S9. entire class of peers (comp. ed. and non-comp. ed.)

S10. large group of peers (comp. ed. only) (9 to entire class)

S11. large group of peers (comp. ed. and non-comp. ed.)(9 to entire class)

S12. small group of peers (comp. ed. only) (3 thru 8)

S13. small group of peers (comp. ed. and non-comp. ed.)(3 thru 8)

S14. one or two peers (comp. ed. only)

S15. one or two peers (comp. ed. and non-comp. ed.)

S16. no peers (i.e., alone)

Physical Setting
(Where Student Works)

Y1. at desk in regular classroom

Y2. on floor in regular classroom

Y3. at table in regular classroom

Y4. in carrel in regular classroom

Y5. at learning center in regular classroom

Y6. on playground (outside school buildings on school grounds)

Y7. in math "lab" (i.e.; some place other than regular classroom where math instruction is being given)

Y8. off school grounds

Pupil Behavior
(What Student Does)

P1. reads silently

P2. reads aloud

P3. writes

P4. talks

P5. listens

P6. observes (watches)

P7. manipulated objects (other than for purposes of reading and writing)

CODING KEY FOR STUDENT ACTIVITY LOG - MATH

Instructional Materials

M 1. _____	M 21. _____
M 2. _____	M 22. _____
M 3. _____	M 23. _____
M 4. _____	M 24. _____
M 5. _____	M 25. _____
M 6. _____	M 26. _____
M 7. _____	M 27. _____
M 8. _____	M 28. _____
M 9. _____	M 29. _____
M 10. _____	M 30. _____
M 11. _____	M 31. _____
M 12. _____	M 32. _____
M 13. _____	M 33. _____
M 14. _____	M 34. _____
M 15. _____	M 35. _____
M 16. _____	M 36. _____
M 17. _____	M 37. _____
M 18. _____	M 38. _____
M 19. _____	M 39. _____
M 20. _____	M 40. No Materials Utilized

CODING KEY FOR STUDENT ACTIVITY LOG - MATH

Instructional Objectives

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

6. _____

_____

7. _____

_____

8. _____

_____

9. _____

_____

10. _____

_____

CODING KEY FOR STUDENT ACTIVITY LOG - MATH

Instructional Objectives

11. _____

_____

12. _____

_____

13. _____

_____

14. _____

_____

15. _____

_____

16. _____

_____

17. _____

_____

18. _____

_____

19. _____

_____

20. _____

_____

CODING KEY FOR STUDENT ACTIVITY LOG -- READING

Teacher Behavior
(What Teacher, Aid, etc. Does)

T1. makes oral presentation

T2. gives demonstration (shows and tells)

T3. facilitates discussion

T4. tutors

T5. not actively involved (students work without instructor)

Social Setting
(With Whom Student Works)

S1. regular classroom

S2. reading specialist

S3. paid aide

S4. volunteer aide

S5. other adult

S6. no adult

S7. older student tutor (from another class)

S8. entire class of peers (comp. ed. only)

S9. entire class of peers (comp. ed. and non-comp. ed.)

S10. large group of peers (comp. ed. only) (9 to entire class)

S11. large group of peers (comp. ed. and non-comp. ed.)(9 to entire class)

S12. small group of peers (comp. ed. only) (3 thru 8)

S13. small group of peers (comp. ed. and non-comp. ed.)(3 thru 8)

S14. one or two peers (comp. ed. only)

S15. one or two peers (comp. ed. and non-comp. ed.)

S16. no peers (i.e., alone)

Physical Setting
(Where Student Works)

Y1. at desk in regular classroom

Y2. on floor in regular classroom

Y3. at table in regular classroom

Y4. in carrel in regular classroom

Y5. at learning center in regular classroom

Y6. on playground (outside school buildings on school grounds)

Y7. in reading "lab" (i.e.; some place other than regular classroom where reading instruction is being given)

Y8. off school grounds

Pupil Behavior
(What Student Does)

P1. reads silently

P2. reads aloud

P3. writes

P4. talks

P5. listens

P6. observes (watches)

P7. manipulated objects (other than for purposes of reading and writing)

CODING KEY FOR STUDENT ACTIVITY LOG - READING

Instructional Materials

M 1. _____	M 21. _____
M 2. _____	M 22. _____
M 3. _____	M 23. _____
M 4. _____	M 24. _____
M 5. _____	M 25. _____
M 6. _____	M 26. _____
M 7. _____	M 27. _____
M 8. _____	M 28. _____
M 9. _____	M 29. _____
M 10. _____	M 30. _____
M 11. _____	M 31. _____
M 12. _____	M 32. _____
M 13. _____	M 33. _____
M 14. _____	M 34. _____
M 15. _____	M 35. _____
M 16. _____	M 36. _____
M 17. _____	M 37. _____
M 18. _____	M 38. _____
M 19. _____	M 39. _____
M 20. _____	M 40. No Materials Utilized

CODING KEY FOR STUDENT ACTIVITY LOG - READING

Instructional Objectives

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

6. _____

_____

7. _____

_____

8. _____

_____

9. _____

_____

10. _____

_____

CODING KEY FOR STUDENT ACTIVITY LOG - READING

Instructional Objectives

11. _____

_____

12. _____

_____

13. _____

_____

14. _____

_____

15. _____

_____

16. _____

_____

17. _____

_____

18. _____

_____

19. _____

_____

20. _____

_____

SUGGESTED LIST OF MATH INSTRUCTIONAL OBJECTIVES FOR USE IN STUDENT ACTIVITY LOG KIT*

1) The student will identify the digit corresponding to a specified place value in a given four digit numeral.

2) Given a five digit decimal numeral with one digit on the left side of the decimal point, the student will identify the digit corresponding to a specified place value.

3) The student will write a Roman numeral expression that corresponds to a specified natural number less than 40.

4) The student will indicate the ratio solution to a simply stated word problem.

5) The student will indicate whether or not two given ratios are equal.

6) The student will calculate the missing term in a proportion equation statement.

7) The student will find the whole number coordinates of a given location on a Cartesian graph with one quadrant.

8) The student will plot the point of a given ordered pair with whole number coordinates. The point will be plotted on a single quadrant Cartesian graph provided for that purpose.

9) The student will find the integer coordinates of a location on a full Cartesian graph.

10) The student will answer simple questions about information given in a pictograph.

11) The student will answer simple questions about information in a bar graph.

12) The student will answer simple questions about information given on a broken line graph.

13) The student will answer simple questions about information given in a circle graph.

14) The student will indicate whether a given syllogism is valid or invalid.

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*These objectives are extracted from a more comprehensive list prepared by the Instructional Objectives Exchange.

15) Given a set containing from zero to nine pictorially represented simple elements, the student will give the cardinal number for the set.

16) Given a set containing from one to three pictorially represented simple elements, the student will select a subset of the given set.

17) Given two disjoint sets, the student will select the set which is the union of the two.

18) Given a number line 10 units long with each unit position marked off, the student will be able to select the number which corresponds to an indicated unit of the number line.

19) Given a whole number less than 100, the student will indicate whether the number is an "even number", an "odd number", or "neither".

20) Given a list of three to five cardinal numbers, the student will select the rearrangement of these numbers which gives the numbers in ascending order of their values.

21) Given a whole number from two to ten, the student will select a multiple of the number.

22) Given a natural number less than 50, the student will select a factor of the number.

23) Given a diagram of a circle, rectangle, or square which is subdivided into from two to nine congruent sections, at least one of which is shaded, the student will select the fraction which describes the shaded of the given diagram.

24) Given a common fraction with either its numerator or denominator asked for, the student will select that requested part of the fraction.

25) Given a set of equivalent fractions, the student will select the number line on which the position indicated by the arrow corresponds to the rational number that is represented by the given set of fractions.

26) Given a common fraction, the student will select its reciprocal.

27) For a given simple decimal fraction, the student will write an equivalent common fraction.

28) The student will be able to solve addition problems involving two, one-digit numerals.

29) The student will be able to solve an addition problem involving a two-digit numeral and a one- or two-digit numeral, not requiring regrouping.

30) The student will be able to solve a word problem whose solution requires addition with one- or two-digit numerals, not requiring regrouping.

31) The student will be able to solve an addition problem requiring regrouping, and involving a three-digit numeral and a one- to three-digit numeral.

32) The student will be able to solve a column addition problem involving at most, five whole numbers.

33) The student will be able to solve an addition problem involving two simple mixed numerals.

34) The student will be able to solve an addition problem involving a four-digit decimal and another decimal with four digits or less.

35) The student will be able to solve a subtraction problem with a non-negative answer, involving two, one-digit numerals.

36) The student will be able to solve a subtraction problem with a non-negative solution not requiring regrouping, involving a two-digit numeral and a one- or two-digit numeral.

37) The student will be able to solve a word problem with a non-negative solution, requiring regrouping, and involving subtraction with two digit numerals.

38) The student will be able to solve a subtraction problem requiring regrouping, whose answer is non-negative, involving a four digit numeral and another numeral with four digits or less.

39) The student will be able to solve a subtraction problem with a non-negative answer involving two simple mixed numerals.

40) The student will be able to say the names of whole numbers less than 100.

SUGGESTED LIST OF READING INSTRUCTIONAL OBJECTIVES FOR USE IN STUDENT ACTIVITY LOG KIT*

1. The student will select from two alternative pairs of letters the pairs that match a given sample pair of letters.

2. Given a series of three-letter combinations, one of which is a sample, the student will select the alternative letter combination which matches the sample.

3. Given sets of pictures of objects, one of which is a sample, the student will be able to mark the alternative picture whose name has the same initial consonant sound as the sample.

4. Given sets of three pictures of objects, one of which is a sample, the student will be able to mark the alternative picture whose name rhymes with the name of the sample.

5. Given sets of three pictures of objectives, one of which is a sample, the student will be able to mark the alternative picture whose name has the final consonant sound as the sample.

6. Given sets of three pictures of objects, one of which is a sample, the student will be able to mark the alternative picture whose name has the same medial vowel as the sample.

7. Given an orally pronounced one-syllable word, separated into its initial phoneme and its ending consonant sound, the student will be able to pronounce the word.

8. The student will be able to select from a group of pictures the picture whose name begins with the sound of a given letter.

9. The student will be able to select from a group of pictures the picture whose name ends with the sound of a given letter.

10 The student will be able to select from a group of pictures the picture whose name begins with the sound of the given blend.

11. The student will be able to select from a group the word which rhymes with a spoken word.

12. The student will be able to select from a group of pictures of objects the picture whose name contains the same short vowel sound as a given sample word.

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* These objectives are extracted from a more comprehensive list prepared by the Instructional Objectives Exchange.

13. The student will be able to select from a group of pictures of objects the picture whose name contains the sound of a given digraph.

14. The student w ll be able to select the compound word from a list of three words.

15. The student will be able to select from a list the phrase equivalent to a given contraction.

16. The student will be able to select a base word from a list of words.

17. The student will be able to select from a group the word which begins with the same consonant blend as an unfamiliar spoken sample.

18. The student will be able to select from a list the word containing a long vowel.

19. The student will be able to select from a list the word which has the same vowel sound as that of a written sample with an r-controlled vowel.

20. The student will be able to select from a list the word whose vowel sound is the same as that of a sample having two consecutive vowels.

21. The student will be able to select from a list the digraph which is found in a spoken sample word.

22. The student will be able to select the form of the word which best completes a given sentence.

23. The student will be able to select from a list the word which contains a silent letter.

24. The student will be able to select the number of syllables found in a given word.

25. The student will select from several written topics, the one which best expressed the main idea of a given picture.

26. Given three statements, the student will select the most general statement.

27. The student will be able to select the statement which expresses the moral of a one paragraph selection.

28. The student will select from several state ments the one which best expresses a factual generalization which can be drawn from a one paragraph factual selection.

29. After reading a paragraph containing information about a particular situation, the student will be able to infer the situation being described and select the sentence completion that identifies the situation.

30. Given written instructions or a simple story involving a series of events to be read aloud once, the student will be able to select from three columns listing the events or instructions in various orders, that column which reflects the sequence as it appears in the story.

31. The student will correctly identify the sequence of three sentences by determining order from tense and words that signal order.

32. Given a written sentence containing a subject pronoun, the student will identify the pronoun referent by selecting from three options a picture that indicates the subject of the sentence.

33. Given a written sentence containing a subject pronoun, the student will identify the pronoun referent from a set of three options.

34. The student will use the context of a selection to identify from among at least two correct definitions for a word, the definition which is appropriate for that contextual setting.

35. Given a simple written negative statement, the student will be able to select from several choices the positive expression which is opposite of the first sentence.

36. Given a list of one-syllable words, containing both long and short vowels, the student will be able to identify which words have long and which words have short vowel sounds.

37. Given sets of sentences, each with a missing word and an adjacent word, the student will be able to write the correct passive form of the adjacent word in the blank.

38. Given a randem list of capital letters the student will be able to identify the name of each letter.

39. Given a random list of lower case letters the student will be able to identify the name of each letter.

40. Given a random list of letters, containing both vowels and consonants, the student will be able to identify which letters are consonants and which are vowels.

APPENDIX G. SCORING AND DEVELOPMENT OF INDICES OF THE EIGHT DIMENSIONS OF INDIVIDUALIZED/STANDARDIZED INSTRUCTION

APPENDIX G: SCORING AND THE DEVELOPMENT OF INDICES OF THE EIGHT DIMENSIONS OF INDIVIDUALIZATION/ STANDARDIZED INSTRUCTION

These variables are measured using data obtained from the Student Activity Log and the debriefing session of Teacher Interview II.

A. Content

A classroom instructional program should be considered to be individualized or standardized with respect to the content dimension to the extent that different objectives are worked on by different students in the class as a function of individual diagnostic-based prescription. From the Logs the objectives applied to each student are ascertained by noting which objectives, if any, have been marked "not relevant" (see Instructions for Student Activity Log Kit in Appendix F). The extent to which different students work on different objectives can thus be assessed by the ratio of the number of different sets of objectives marked "not relevant" to the number of students in the classroom. From the accompanying interview the basis for assigning objectives to students is ascertained. This can vary from diagnosis of and prescriptions for individual students, individual or no diagnosis with prescriptions for instructional groups to individual or no diagnosis with prescriptions for the entire class. These represent the three major categories of diagnostic-based prescriptions: individual, sub group, and entire class.

B. Sequence

A classroom instructional program is considered individualized or standardized with respect to the sequence dimension to the extent that different students work on a given set of instructional objectives in different sequences as a result of individual diagnostic-based prescriptions. From the Logs the sequence of proceeding through objectives for each student can be obtained by using the "beginning date" notations to order objectives. The ratio of the number of different sequences over the number of students in the class provides the measure of the extent to which different students work on a given set of objectives in different

sequences. From the accompanying interview the basis for assigning sequences of objectives to students is ascertained, providing information (as with the content dimension) as to whether an individual, sub group, or entire class diagnostic-based prescription obtains.

C. Rate

A classroom is considered individualized or standardized with respect to the rate dimension to the extent that different students are alloted different amounts of time in proceeding through given objectives as a result of individual diagnostic-based prescriptions. From the Logs, using the "number of hours" spent working on objectives, the ratio of different time allotments to number of students can be assessed for each objective. The ratios for all objectives can be averaged, providing a measure of the extent to which different students are alloted different amounts of time in proceeding through given objectives. Data from the accompanying interview indicates whether individual, sub group, or entire class diagnostic-based prescriptions occur.

D. Materials, Physical Setting, Social Setting, Teacher Behavior, and Pupil Behavior

A classroom is considered to be individualized or standardized with respect to each of these dimensions to the extent that different materials, physical settings, social settings, teacher behaviors, and pupil behaviors are associated with students working on given instructional objectives as a result of diagnostic-based prescriptions. From the Logs, using the appropriate codes, the ratios of the number of different sets of materials, physical settings, social settings, teacher behaviors, and pupil behaviors to the number of students can be assessed for each objective. The respective ratios for all objectives can be averaged, providing a measure of the extent to which different materials, physical settings, social settings, teacher behaviors and pupil behaviors are associated with different students working on given objectives. And as with the other dimensions, data from the accompanying interview indicates whether individual, sub group, or entire class diagnostic-based prescriptions occur.

APPENDIX H. TELEPHONE SCREENING GUIDE

TELEPHONE SCREENING GUIDE

Interview Schedule: Teachers

My name is..... I'm calling for..... We're working on a project funded by the National Institute of Education to investigate instructional practices that enhance the math and reading achievement of students in compensatory education programs.

Your classroom is one of many which has been selected for possible inclusion in this study. We are interested in obtaining a preliminary description of how your and other teachers' classrooms operate. A diverse group of classrooms will be more throgouhly studied at a later date.

We think that this study is an extremely important one, potentially having a major impact on congressional actions as well as providing useful information to educational practitioners. We hope that you will cooperate in this important endeavor by giving us approximately 20 minutes of your time to answer a few questions.

Do you have any questions before we begin?

_____

_____

_____

School: _____ Telephone No.: _____

Address: _____
(Number and Street) (City and State)

Respondent's Name: _____

Interviewer's Name: _____

Length of Interview: _____ Date: _____

Interviewer's comments (cooperativeness, etc. of respondent): _____

_____

_____

_____

_____

1. Could you tell me how many students you have in your class?

_____

2. Do you know (approximately) how many of your students are "target" compensatory education (e.g., Title I Program) students?

____Yes, how many?____

____No, I don't know. ----------

____Not certain how many such students. -------

____I don't think there are any such students. ---

SKIP TO QUESTION #3

2A. Do any of these compensatory education students receive any of their math (reading) instruction in the regular classroom? (If "YES") Who usually is involved with their instruction?

Math	Reading	
____	____	(1) No
____	____	(2) Yes, I (the regular teacher)
____	____	(3) Yes, an aide
____	____	(4) Yes, another teacher (what is his/her job title?) _____
____	____	(5) Yes, other (specify): _____ _____

2B. Do any of the "target" compensatory students receive any of their math (reading) instruction in some other setting? (If "YES") could you explain?

Math	Reading	
____	____	(1) In a special "lab" class or math (reading) room.
____	____	(2) Special "lab" class, but not only for compensatory education students.
____	____	(3) Other (specify): _____ _____

Now, I'd like to ask you about how your class as a whole is organized for instructional purposes.

3. First, we have found that many teachers have some set of objectives that guide their instructional efforts. Some teachers work from a formal written list of such objectives which must be followed; other teachers have a list of objectives but they keep it "in their heads." Do you organize your teaching efforts in math (reading) around SPECIFIC instructional objectives?

Math	Reading		
____	____	(1)	No objectives (INTERVIEWER: Probe to be certain then thank respondent for their cooperation and terminate interview.)
____	____	(2)	Yes, a formal written list (who generated it?) _____
____	____	(3)	Yes, "keep objectives in my head."
____	____	(4)	Yes, Other (specify): _____ _____

3A. Could you give me some examples of MATH (READING) objectives?

(INTERVIEWER: Help respondent identify 2-3 objectives for both MATH and READING. Guidance should be given to obtain objectives that are 1) specific, pertaining to instruction that normally requires 1-2 weeks to complete and 2) behavioral, describing something that students would do, and 3) focus on one student. EXAMPLE: "The student will be able to select from a group the word which rhymes with a spoken word.)

MATH

1. _____ _____
2. _____ _____
3. _____ _____

READING

1. _____
_____

2. _____
_____

3. _____
_____

4. In thinking about the math (reading) objectives just listed as well as other such objectives that apply to any students in your classroom, would you say that all of your students work on the same set of objectives or are there objectives that apply only to some of your students. (Check one for <u>both</u> math and reading)

Math	Reading	
____	____	(1) All students work on the same set of objectives.
____	____	(2) All students work on a "core-set" of objectives, at least some students work on a few other objectives.
____	____	(3) All students within an instructional group work on the same set of objectives; intergroup differences
____	____	(4) All students within an instructional group work on a "core-set" of objectives, while at least some of the students in the group work on other objectives; major intergroup differences.
____	____	(5) All students work on significantly different sets of objectives, although a few objectives are applied to most of the students.
____	____	(6) All students work on completely different sets of objectives; no students ever work on the same objective

(INTERVIEWER: Probe to make certain that no objectives are applied to more than one student in the class even over the course of a school year. IF THE PROBE DOES NOT POINT TO A DIFFERENT RESPONSE, thank the respondent for his/her cooperation and terminate interview.

Math	Reading		
____	____	(7)	Other (specify):_____
			_____

4A Can you tell me how these objectives are set? (Check one for both math and reading.)

Math	Reading		
____	____	(1)	Prior to start of year, administrators or teachers prescribe the set of objectives that the class (grade level) will work on.
____	____	(2)	Instructional materials or commercial programs provide a set of objectives that are applied to students using them.
____	____	(3)	Students decide (via a vote, etc.) the set of objectives to be worked on by the class.
____	____	(4)	Teacher diagnoses students and prescribes the set of objectives that the class will work on.
____	____	(5)	Teacher diagnoses students and assigns them to instructional group for which a set of objectives is prescribed (group sizes): _____
____	____	(6)	Individual students choose the objectives that they will work on.
____	____	(7)	Teacher and student negotiate a "contract," specifying the set of objectives to be worked on.
____	____	(8)	Teacher diagnoses students and prescribes which objectives they should work on as individuals.
____	____	(9)	Other (specify):_____
			_____
			_____

5. With regard to the math (reading) objectives on which several or all of your students work, do these students proceed through this set of objectives in the same order or do some of these students work on objectives in different sequences? (Check for both math and reading)

Math	Reading	
____	____	(1) All of these students proceed through the set of objectives in the same order.
____	____	(2) Most of the students proceed through the set of objectives in the same order, some in different sequences.
____	____	(3) All students within instructional groups proceed through the set of objectives in the same order; intergroup differences. (NOTE: This implies that the instructional groups work on a common set or subset of objectives.)
____	____	(4) None (or very few) of these students work on the set of objectives in the same order.
____	____	(5) Other (specify): _____

5A How is the sequence of objectives determined?

Math	Reading	
____	____	(1) Sequence is determined by subject matter, instructional materials or teachers' and administrators' decisions prior to the beginning of the year.
____	____	(2) Students decide (via a vote, etc.) the sequence on which the objectives will be worked by the class as a whole.
____	____	(3) Teacher diagnoses students and prescribes the sequence on which objectives will be worked for the entire class.

Math	Reading		
____	____	(4)	Teacher diagnoses students and assigns them to an instructional group for which the sequence of objectives is determined (group sizes): _____
____	____	(5)	Individual students choose the sequence on which they will work on objectives.
____	____	(6)	Teacher and student negotiate "contract" specifying the sequence for working on objectives.
____	____	(7)	Teacher diagnoses students and prescribes the sequence on which objectives will be worked on
____	____	(8)	Other (specify): _____

6. Still thinking about the math (reading) objectives on which several or all of your students work, are all students allotted the same amount of time in working on particular objectives or are some students given more time than others? (Check one for both math and reading.)

Math	Reading		
____	____	(1)	All students allotted the same amount of time
____	____	(2)	Most students allotted the same amount of time, a few given more or less time
____	____	(3)	All students within a group allotted same amount of time; intergroup difference.
____	____	(4)	Most students with a group allotted same amount of time; intergroup differences.
____	____	(5)	No students are allotted the same amount of time, each student given a different time allotment.
____	____	(6)	Other (specify): _____

6A. What determines the amount of time that is allotted to students to work on particular objectives? (Check one for <u>both</u> math and reading.)

Math	Reading		
____	____	(1)	Time allotted is determined by instructional materials and/or teacher/administrator decision prior to beginning of the school year.
____	____	(2)	Students decide (via a vote, etc.) the amount of time that the class will spend in working on particular objectives.
____	____	(3)	Teacher diagnoses students and prescribes how much time the class will spend working on particular objectives.
____	____	(4)	Teacher diagnoses students, etc., and assigns them to an instructional group for which the length of time spent in working on given objectives is determined.
____	____	(5)	Individual students work on particular objectives until they have completed them.
____	____	(6)	Teacher diagnoses students and allots time for working on particular objectives accordingly.
____	____	(7)	Other (specify): _____

7. Again, thinking about the math (reading) objectives on which several or all of your students work, do all of these students use the same instructional materials when working on particular objectives or do some of these students use different materials? (Check one for <u>both</u> math and reading.)

Math	Reading		
____	____	(1)	All students use the same materials.
____	____	(2)	Most use the same materials, some use different ones.

Math	Reading		
____	____	(3)	All students within group use same materials; intergroup differences.
____	____	(4)	Most students in group use same materials; intergroup differences.
____	____	(5)	None of the students use the same materials, all use different ones.
____	____	(6)	Other (specify):_____

7A. For particular objectives how are instructional materials selected?

Math	Reading		
____	____	(1)	Materials determined by teacher and/or administrator decision prior to beginning of school year.
____	____	(2)	Students decide (via a vote, etc.) which materials will be used when working on particular objectives.
____	____	(3)	Teacher diagnoses students and selects the materials to be used commonly by the entire class.
____	____	(4)	Teacher diagnoses students and assigns them to instructional groups for which instructional materials are selected.
____	____	(5)	Individual students choose the materials they will use when working on particular objectives.
____	____	(6)	Teacher and student negotiate "contract" specifying the materials to be used when working given objectives.
____	____	(7)	Teacher diagnoses students and prescribes for individuals which materials will be used accordingly.
____	____	(8)	Other (specify):_____

8. Additionally, with respect to the math (reading) objectives on which several or all of your students work, do you act basically the same way when dealing with all students or do you do different things with different students. (Check one for both math and reading)

Math	Reading	
____	____	(1) Teacher does basically the same thing with all students who are working on particular objectives.
____	____	(2) Teacher does basically the same with most students, some receive different treatment.
____	____	(3) All students within an instructional group are treated in the same manner by the teacher; intergroup differences.
____	____	(4) Most students within an instructional group are treated in the same manner; some intragroup differences and significant intergroup differences.
____	____	(5) Teacher does basically different things with almost every student who is working on particular objectives.
____	____	(6) Other (specify):_____ _____ _____

8A. How do you determine how you should act when dealing with various students? (Check one for both math and reading.)

Math	Reading	
____	____	(1) Teacher has developed with experience the best things to do with all students who are working on particular objectives.
____	____	(2) Students decide (via a vote, etc.) what kinds of things the teacher should do in working with the entire class.
____	____	(3) Teacher diagnoses students and decides what would be the best things to do when working with the entire class.

Math	Reading		
____	____	(4)	Teacher diagnoses students and assigns them to instructional groups for which the things that the teacher does in working with students is determined.
____	____	(5)	Individual students determine (by asking) what the teacher does in working with them.
____	____	(6)	Teacher and student negotiate "contract" specifying the things that the teacher should do in working with the student on particular objectives.
____	____	(7)	Teacher diagnoses students and determines the best things to do with each student who is working on particular objectives.
____	____	(8)	Other (specify):_____ _____ _____

9. Another question about the math (reading) objectives on which several or all of your students work, do all of these students work on particular objectives in the same physical settings or do some of these students work in different settings? For example, do some students work at a desk, while other work on the floor and still others work somewhere outside the classroom or perhaps off the school grounds. (Check one for both math and reading.)

Math	Reading		
____	____	(1)	All work in same physical setting.
____	____	(2)	Most work in same physical setting, some in different ones.
____	____	(3)	All students in group work in same physical setting; intergroup differences.
____	____	(4)	Most students in group work in same physical setting; intergroup differences.
____	____	(5)	None work in same physical setting, all work in different ones.
____	____	(6)	Other (specify):_____ _____ _____

9A. How is the physical setting determined for students working on particular objectives? (Check one for both math and reading.)

Math	Reading		
____	____	(1)	Limited facilities, school regulations, or subject matter determine where students work
____	____	(2)	Students decide (via a vote, etc.) where the entire class or group will work on particular objectives.
____	____	(3)	Teacher diagnoses students and determines where the entire class will work on particular objectives.
____	____	(4)	Teacher diagnoses students and assigns them to an instructional group for which the setting is determined.
____	____	(5)	Individual students choose where they will work on particular objectives.
____	____	(6)	Teacher and student negotiate "contract" specifying where particular objectives will be worked on.
____	____	(7)	Teacher diagnoses students and prescribes for individuals where they will work on particular objectives.
____	____	(8)	Other (specify):_____ _____ _____

10. Furthermore, with regard to the math (reading) objectives on which at least several students work, do all of these students work on particular objectives in the same kind of social settings or do some students work alone, while others work in small groups or in larger groups? (Check for both math and reading.)

Math	Reading		
____	____	(1)	All students work in the same size group (the entire class).

Math	Reading		
____	____	(2)	All student work alone.
____	____	(3)	All students within an instructional group work together, thus all students in the class work in approximately the same size group.
____	____	(4)	Most students within an instructional group work together, though a few work individually or in subgroups.
____	____	(5)	Students work in many different sized groups, which are created for working on particular objectives and not for an all work in a subject
____	____	(6)	Other (specify):_____ _____ _____

10A. How do you determine who is grouped together when working on particular objectives? (Check one for both math and reading.)

Math	Reading		
____	____	(1)	All students who are working on a given objective work together.
____	____	(2)	Ability groupings determine the other students with whom a student works on particular objectives.
____	____	(3)	Ability groupings determine the other students with whom most students work on particular objectives; some students work together because they like each other or because teacher thinks they work well together.
____	____	(4)	All students choose who they will work with on particular objectives.
____	____	(5)	Teacher diagnoses students and decides on the basis of something other than ability who is grouped together to work on particular objectives.

Math	Reading		
____	____	(6)	Other (specify): _____

11. Finally, with respect to the math (reading) objectives on which at least several students work, do all of these students engage in the same kind of activity or do different students do different kinds of things (e.g., reading vs. writing or talking) while working on particular objectives? (Check one for both math and reading.)

Math	Reading		
____	____	(1)	All students working on the same objective engage in the same activity.
____	____	(2)	Most students working on the same objective engage in the same activity; a few do different things.
____	____	(3)	All students within instructional groups engage in the same activities when working on particular objectives: intergroup differences in activity for those working on the same objectives.
____	____	(4)	Most students within instructional groups engage in the same activities; some intragroup differences and significant intergroup differences.
____	____	(5)	None (or few) of the students working on given objectives engage in the same activities; most or all students do different things.
____	____	(6)	Other (specify): _____

11A. How do you determine what kinds of things students do when working on particular objectives.

Math	Reading	
____	____	(1) Activity determined by materials or teacher and/or administrator decision prior to start of year.
____	____	(2) Students decide (via a vote, etc.) what activities the class will do when working on given objectives.
____	____	(3) Teacher diagnoses students and prescribes the activities that the entire class will engage in together.
____	____	(4) Teacher diagnoses students and assigns them to an instructional group for which the type of activity to be done while working on given objectives is prescribed.
____	____	(5) Individual students choose the type of activity to be done in working on given objectives.
____	____	(6) Teacher and student negotiate "contract" specifying the type of activity to be done in working on particular objectives.
____	____	(7) Teacher diagnoses students and prescribes for individuals the type of activity to be done in working on particular objectives
____	____	(8) Other (specify):_____ _____ _____

That concludes this interview. THANK YOU VERY MUCH FOR YOUR TIME AND COOPERATION!!! After the telephone screening has been completed and final decisions about the sample have been made (by the beginning of next school year), you will be notified if your classroom has been selected for more in-depth study and will be given further instructions about study and your involvement in it.

Do you have any further questions? THANK YOU AGAIN FOR YOUR COOPERATION!!!!

APPENDIX I. LIST OF POTENTIAL SAMPLE PROGRAMS

(From Pilot Telephone Screening)

List of Potential Sample 3rd Grade Classrooms
from Pilot Telephone Screening
(Corresponds to descriptive information in Exhibit III-1)

1. Wendy Woehler, Maple Elementary, Rockford, Illinois
2. Betty Stoggens, Baskin Elementary, San Antonio, Texas
3. Helene Augustine, Lockett Elementary, New Orleans, Louisiana
4. Polly Lovin, Westminister Elementary, Westminister, South Carolina
5. Phyllis Freedman, Coggeshall Elementary, Newport, Rhode Island
6. Mary Bell, Alexander Hillsboro Elementary, Tampa, Florida
7. Anna Mitchel, Sinclairville Elementary, Sinclairville, New York
8. Della Hoggan, Blackshear Elementary, Houston, Texas
9. Marvin Barcken, Escalante Valley Elementary, Beryl, Utah
10. Daniel Levy (Principal reporting on striking teacher's classroom), Public School #11, Brooklyn, New York
11. Phyllis Brown, Melvin H. Kreps Elementary, East Windsor, New Jersey
12. Christine Powlsen, South Park Elementary, Los Angeles, California
13. Jill Hewitt, Thomas Johnson Elementary, Baltimore, Maryland
14. Emma Jackson, New Augusta Attendance Center, New Augusta, Mississippi
15. Suzanne Pearson, Runnels Elementary, Runnells, Iowa
16. Phyllis Dotson, Century Park Elementary, Inglewood, California
17. Gayle Behm, Roosevelt Elementary, Scotts Bluff, Nebraska
18. Kathy Brunnex, Thornton Elementary, Thornton, Colorado
19. Terria, Borkin, Nichols Elementary, Detroit, Michigan

20. Rebecca McClure, Daniel Weiss Elementary, Indianapolis, Indiana

21. Gloria Kellan, Iowa Maple Elementary, Cleveland, Ohio

22. Mae Neal, Morvia Primary School #105, Baltimore, Maryland

23. Val Meir, Casady Elementary, Des Moines, Iowa

24. Ellen Doyle, Lincoln Avenue Elementary, Springfield, Massachusetts

25. Patty Bowen, Ridgecrest Elementary, Phenix City, Alabama

26. Sara Brody, Wintonburg Elementary, Bloomfield, Connecticutt

27. Theresa Szwabo, Walnut Grove Elementary, Ferguson, Missouri

28. Marcia Goldstein, A. F. Herrdon Elementary, Atlanta, Georgia

29. John Thigpen, Camelia Elementary, Sacramento, California

30. Betty Smith, James Wadsworth Elementary, Chicago, Illinois

31. Ruby Williams, Valley Springs Elementary, Valley Springs, Arkansas

32. Yevette Witkins, 12th Street Elementary, Milwaukee, Wisconsin

33. Ramona Kirby, Soroco Elementary, Yampa, Colorado

34. Nancy Yonkee, Broadus Elementary, Broadus, Montana

35. Elaine Wilson, Broadway Elementary, Venice, California

36. Kathy Briggs, Robert Kennedy Elementary, San Jose, California

37. Jackie Hall, Myrtle Tate Elementary, Las Vegas, Nevada

38. Diane Shope, Alderman School, Greensboro, North Carolina

39. Ruth Bayers, 18th Avenue Elementary, Newark, New Jersey

40. Vera Greenwood, 116th Street Elementary, Los Angeles, California

41. Carolyn Szymanski, Rose School, Detroit, Michigan

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